Microcor® Tools

Version 4.0.0

User Manual

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Chapter 1
Introduction and Installation

The Microcor Tools Software enables users to collect, save, transfer and display corrosion information from Microcor Transmitters and Data Loggers, and Corrater E9020 Transmitters. It is available in two versions:

1. Microcor Tools Standard
2. Microcor Tools - Output Interfaces

The **Microcor Tools Standard** version is a stand-alone software package for installation on your computer to provide data retrieval, storage, and graphical presentation of results from Microcor and E9020 Corrosion Transmitters and Data Loggers.

Microcor Tools - Output Interfaces is an enhanced version of the software which provides Modbus and OPC out put interfaces for data transfer from Microcor and E9020 on-line transmitters to Distributed Control Systems (DCS), Process Control Systems (PCS), or Supervisory Control and Data Acquisition (SCADA) systems. This software package is included on RCS Supplied hardware such as the Intelligent Interface Unit (IIU). See separate hardware manual for more details.

The Microcor Tools Software CD comes with the software installation package, manuals, and datasheets for PC installation. Insert the CD in the CD-ROM drive and the AutoPlay feature will open the welcome page which will provide links to the Software Installation files, User Manuals, and Datasheets. To install the software, click the **Install** button. If the AutoPlay feature is disabled, browse to the **MicrocorTools.exe** file on the CD and double click, then follow the onscreen instructions to finish the install. Microcor Tools Software is now ready for use.

If the default install settings are kept (recommended) when installing the Microcor Tools Software, all associated files will be installed in the C:\Program Files\MicrocorTools directory.

Microcor Tools Software is not designed as a client/server application but it may be operated on a Network with some minor limitations. The database may be read by multiple computers, but the basic configuration file **modb.CFG** and data may only be written to by one PC at any one time.

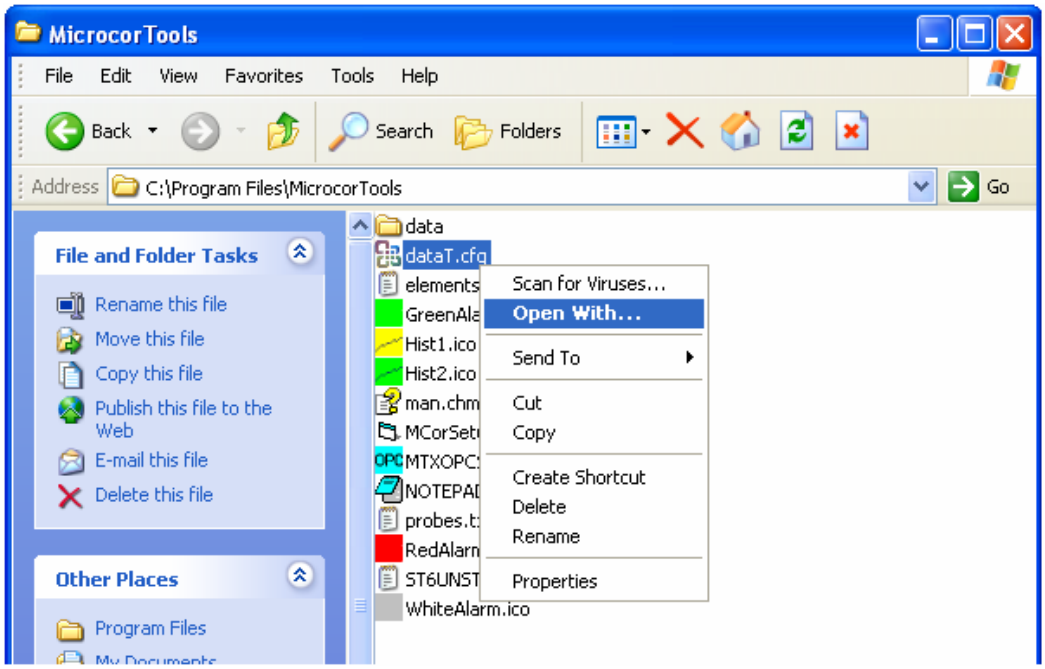
If requirements exist for making the database of the Microcor Tools available to multiple computers or if the database is to be stored on a server, the location of the database can be changed as follows:

If for example the database is to be stored on a backup server that is mapped to the local computer such as in the directory path **Z:\Userdata\Microcor** proceed as follows:

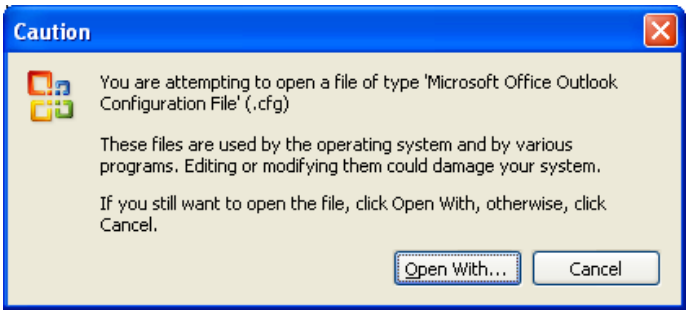
1. Create a **MicrocorToolsDatabase** subfolder in the **Z:\Userdata\Microcor.**

2. Find the **dataT.cfg** file (the default location is C:\Program Files\MicrocorTools unless). and rename it to **data.cfg**

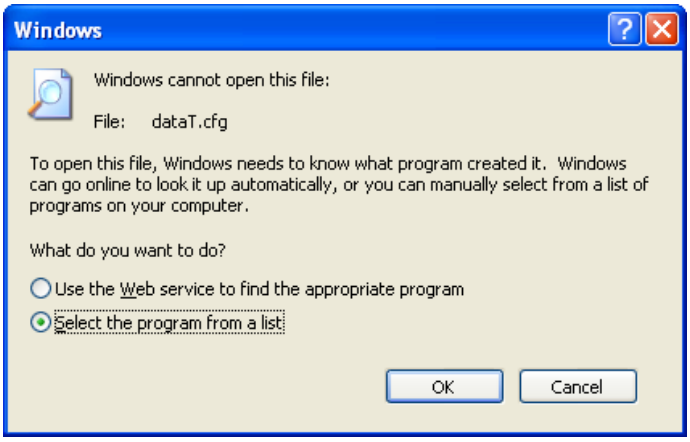
3. Right-click the **data.cfg** file and select **Open with** to edit the content with **Notepad** or **WordPad** (shown below):



Following Microsoft dialog boxes may appear:

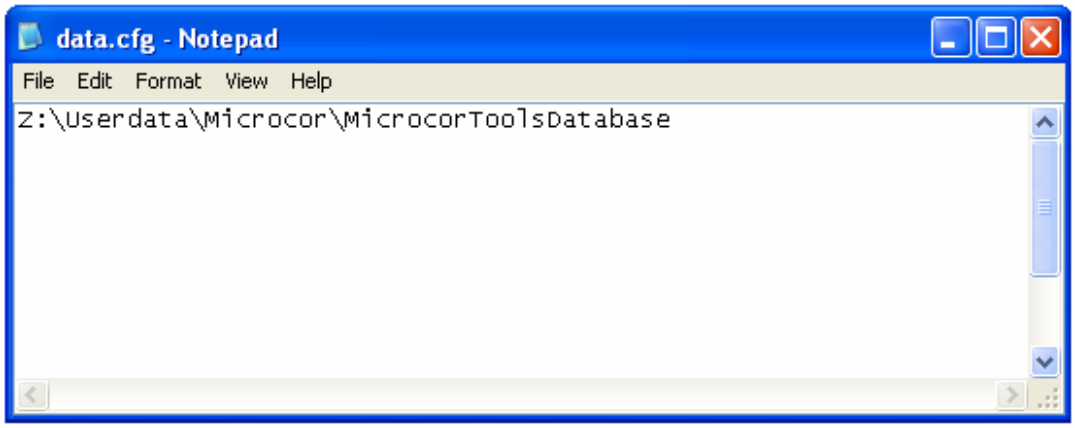

Caution
You are attempting to open a file of type 'Microsoft Office Outlook Configuration File' (.cfg)
These files are used by the operating system and by various programs. Editing or modifying them could damage your system.
If you still want to open the file, click Open With, otherwise, click Cancel.
Open With...
Cancel

Choose **Open With**… and the following dialog box will open:


Windows
Windows cannot open this file:
File: dataT.cfg
To open this file, Windows needs to know what program created it. Windows can go online to look it up automatically, or you can manually select from a list of programs on your computer.
What do you want to do?
Use the Web service to find the appropriate program
Select the program from a list
OK
Cancel

Choose **Select the program from a list** and click **OK**. Choose Notepad or WordPad from the next screen to proceed to edit the **data.cfg** file.

4. When the Notepad editor opens, change the path **C:\aa** with the following path **Z:\Userdata\Microcor\MicrocorToolsDatabase** (shown below) and **Save** and **Exit**.

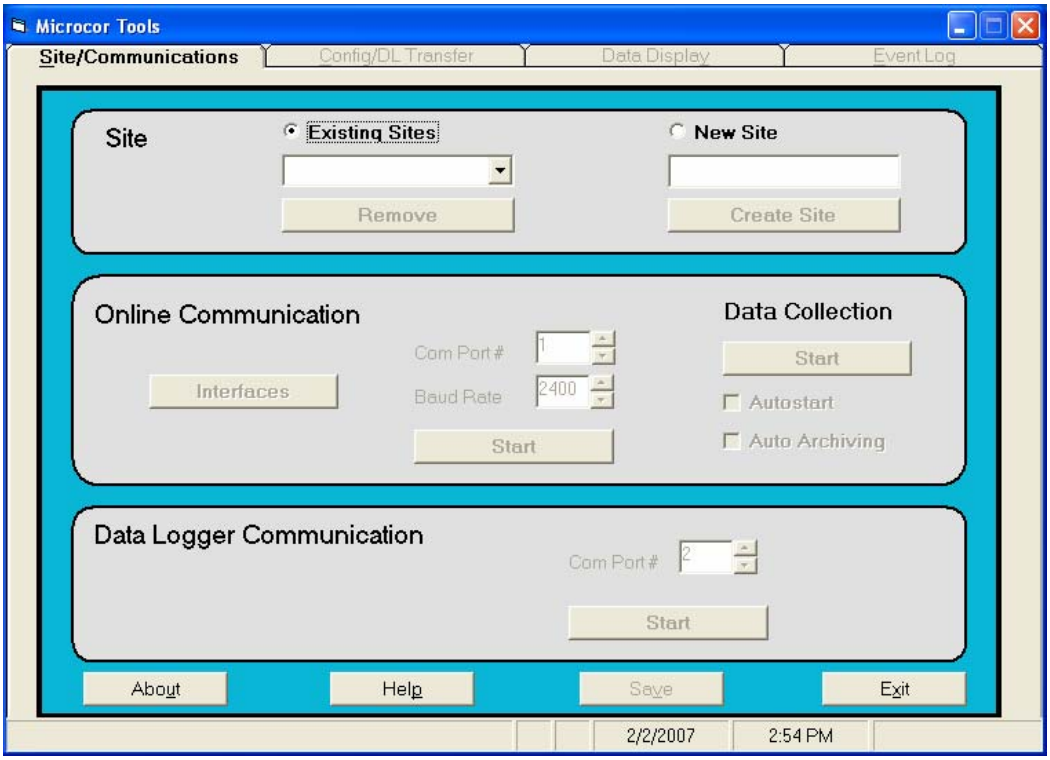


Note: If the Microcor Tools Software program has already been used and data has been collected, then this collected data can be transferred to the new shared database location. Copy the **data** file directory (not the newly renamed data.cfg file) from C:\Program Files\MicrocorTools to the new directory.

It is also possible to share the database when a single computer is shared amongst multiple users. Simply choose a shared location such as **Shared Documents** of the **All Users** profile for the database and follow the above procedure.

Chapter 2
Configuration and Setup

To launch the **Microcor Tools** program, click **Start → All Programs → RCS → Microcor Tools**.



Onscreen help is accessible by clicking on the **Help** button.

Create, Select and Remove Sites

A Site is a collection of up to 100 corrosion-monitoring locations. The corrosion information for these locations can be provided from the following data sources:
- Online data collection via the RS485 network from Microcor Transmitters
- Online data collection via RS485 network from Corrater E9020 Transmitters
- Offline data input from Microcor Data Loggers or data-transfer units
- Offline data imported from archives or files, or the previous versions of Microcor software.

Create a Site
Select the **New Site** option button and type a name in the text box (**Existing Sites** option button is selected by default). Click the **Create Site** command button.

Select an Existing Site
Select the **Existing Sites** option button, open the list box and click on the desired site name.

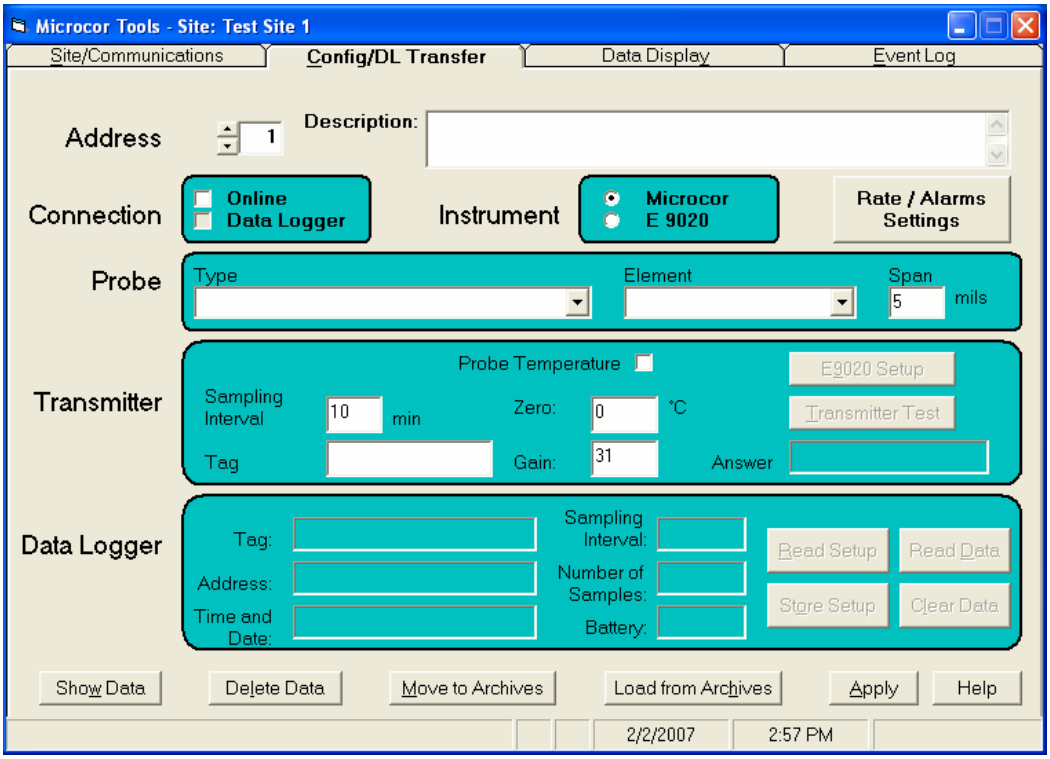
Remove a Site
Select the **Existing Sites** option button, open the list box and click on the desired site name. Click the **Remove** command button to remove the site.

Use the **Save** command button at the bottom of the screen to store all settings for the selected site.

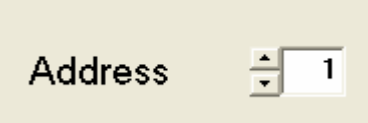
Configuring Site and Instrument Locations

1. Create a new site or use the **Site** list box on the **Site/Communications** tab to select a site.

2. Click the **Config/DL Transfer** tab to select the configuration screen.



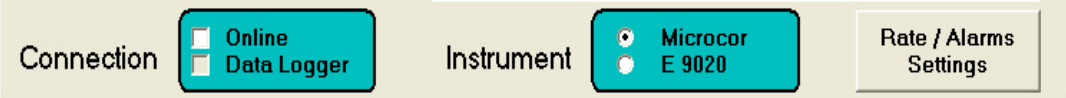
3. Locate the **Address** area. Use the Up/Down control or type the number in the text box.



If the data source for this location is an online transmitter, the **Address** must be equal to the transmitter address. Internally, each transmitter has a DIP switch with a selectable address (0 to 99 for Model MT 9485A and E9020 and 0 to 31 for Model MT 9485. The preset address is marked on the outside of the transmitter as the IN# or Instrument Number. See the transmitter manual for more details. If the data source is a data logger or data-transfer unit, RCS recommends that the IN # of the transmitter connecting to the data logger is used.

4. Complete the **Description** field with the provided free-format text description area to meaningfully identify the location (optional).

5. Proceed to the **Connection, Instrument and Rate/Alarms Settings** area.

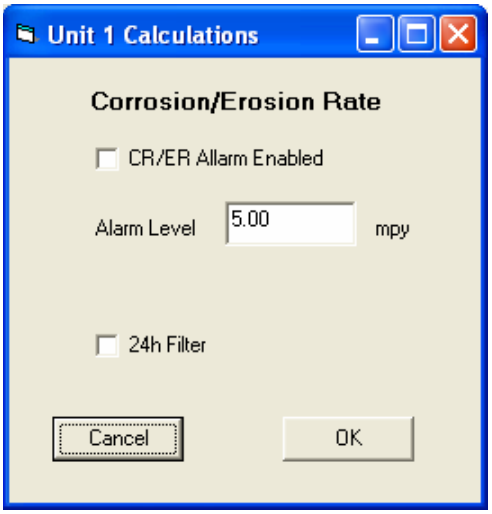


Click the check box to select either **Online** or **Data Logger** data transfer method. Supported transmitters are Microcor (MT 9485A and Microcor MT 9485) and Corrater E9020. E9020 transmitters are used with **Online** connections only.

Note: To be able to check the Data Logger checkbox, it is first necessary to select the COM port in the Data Logger section of the Site/Communication tab and click the start button.

Note: It is important to ensure that the "**Hibernate**," "**System Standby"** and "**Turn off hard disks**" on the **Windows Power Options** is turned to "**Never**" so data collection will not be interrupted on **Online** systems.

The **Rate/Alarms Settings** command button opens the following screen:

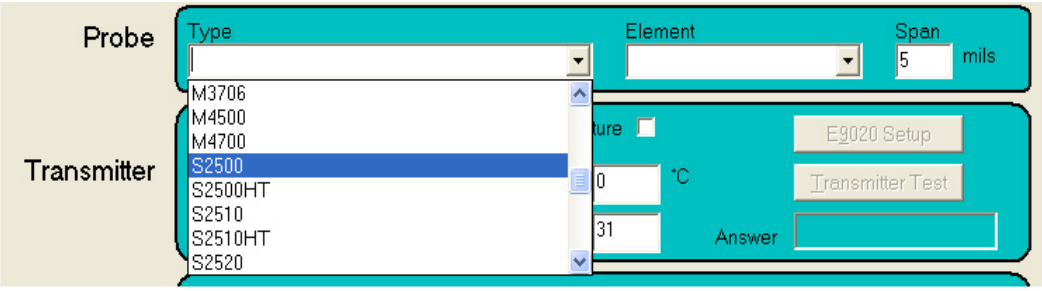


Users can choose to enable the alarm by selecting the **CR/ER Alarm Enabled** button. However, it is important to note that this feature is only relevant when used on **Online** systems. **Alarm Level** can be changed by typing in the desired value. The measurement units are specified to the right of the alarm level value and this can be changed in the Graphical Display (**History Viewer**) screen (click on the **Show Data** command button; see the **Retrieving and Plotting Data (History Viewer)** section for more details). Once the alarm is activated, the **Parameter 3** column on the **Data Display** screen will turn red if the corrosion rate exceeds the set alarm rate. A blinking red/gray indicator will replace the green indicator on the status bar located on the bottom of the Microcor Tools application screen (see the section on the **Online Data Collection** below for more details).

The standard method for corrosion rate calculations is by Linear Regression which can be changed by checking the **24h Filter**. Checking the **24h Filter** adds a 24 hour filter specifically to reduce the effects of any diurnal (24) thermal noise. Linear Regression values are adjustable and can be set on the Graphical Display (**History Viewer**) screen.

6. Proceed to and complete the **Probe** section once the above selections are made.

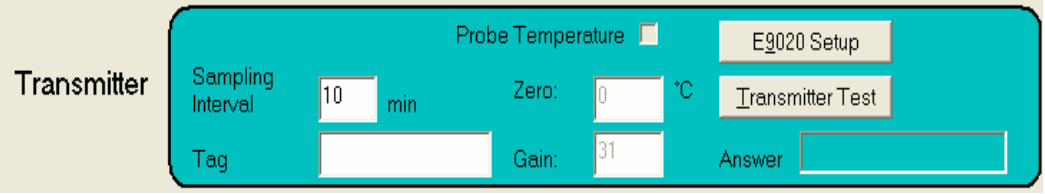
Type and **Element** are optional informational fields which will be useful later when reviewing the corrosion/erosion data. It is possible to type content in on these fields if the probe information does not exist or if customization is desired. Probes designated with type "M" are used for corrosion monitoring and type "S" are used for erosion monitoring.



Span [mils] is the useable life of the probe element. This is always defined in units of mils and is one half of the probe element thickness (i.e. F10 or T10 probes have a 5 mil span). This required field is used to define the physical scale of the metal loss graph. The appropriate Span is automatically set when the **Probe Element** is chosen from the drop down menu; however, users may change the **Span** by typing in a different value if necessary. If the required **Probe Element** is not in the list, choose **BLIND** as the **Element**, which will set the **Span** to 1; this can be changed as needed.

Note: The BLIND setting may also be used with the Microcor Tools – Output Interfaces version when used on blind Intelligent Interface Units. This allows scaling changes for different probe spans to be accommodated internally on the IIU such as in DCS or SCADA systems.

7. Proceed and complete the **Transmitter** section (this information is necessary for both **Online** and **Data Logger** connection types).



Sampling Interval is used to set the data-record frequency.

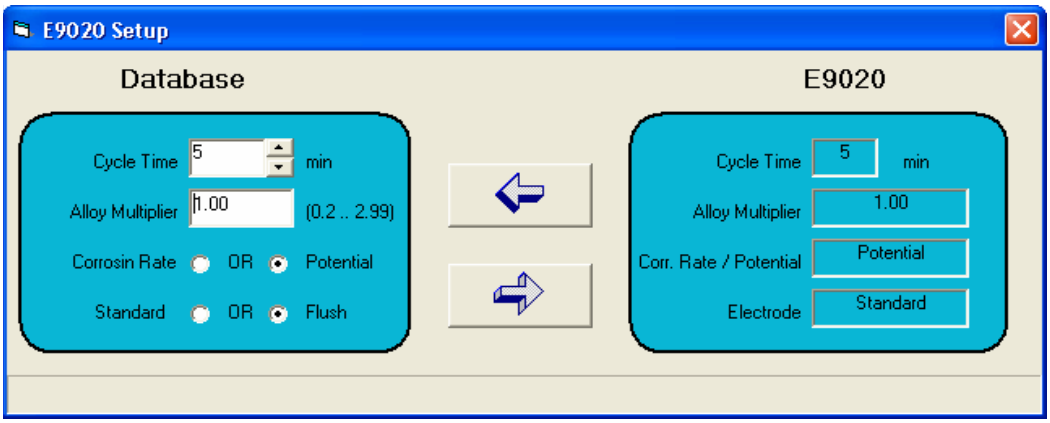
For **Online** metal loss (Microcor) transmitters (MT 9485A and MT 9485) the minimum recommended setting is 2 minutes. A typical **Sampling Interval** would be 5 minutes, which will yield 12 readings per hour. For corrosion rate transmitters (E9020), the **Sampling Interval** should be 5, 10, 15 or 20 minutes, depending on the selected cycle time.

For Microcor Transmitters driven by **Data Loggers**, where battery consumption is a consideration, a **Sampling Interval** of 3 hours (180 minutes) is usually selected. This gives a battery life of up to one year, and still provides eight readings per day. The minimum recommended **Sampling Interval** for **Data Loggers** is 30 minutes with the maximum setting at 1440 minutes (one day).

Tag is an optional free-format text field used to identify the probe, which provides labeling on the graphical display (**History Viewer**) screen.

Check the **Probe Temperature** check-box if the transmitter has the probe temperature measurement capability and if the function is enabled by the internal transmitter DIP switch (see transmitter manual for details). Temperature measurement is available only on certain probe models. Select (type in) values for **Zero** and **Gain** to calibrate the measurement. If calibration parameters are unknown for probes and transmitters, select 0 for **Zero** and 31 for **Gain**. If the probe-temperature measurement function in the transmitter is not enabled or the transmitter does not support probe-temperature measurements uncheck the **Probe Temperature** check-box.

The **E9020 Setup** command button opens the following configuration screen:



The two sections represent the settings stored in the computer and in the instrument. The command buttons with arrows provide transfer of the settings in both directions:

- from the PC to E9020
- from E9020 to the PC

To store the new configuration from the database to the E9020, choose the bottom arrow pointing to the right. To read the current configuration of the E9020, choose the top button with the arrow pointing left.

Cycle Time is used to set the desired measurement cycle time. For water with conductivities greater than 100 µS, any cycle time of 5 minutes or more should be satisfactory. For lower conductivity water, or when filming type inhibitors are in use, it is recommended that the 20 minute cycle time be selected first. After consistent readings are obtained, then a shorter time cycle can be selected as long as the readings do not increase substantially (>5%) over the readings taken with a 20 minute cycle.

Set the **Alloy Multiplier** to the appropriate multiplier value for the metal or alloy of the electrodes as shown in the chart of Appendix 1.

The E9020 setup allows the user to choose from either the **Corrosion Rate** or the **Potential and Current Noise Measurement**. Contact RCS for more information regarding the **Potential and Current Noise Measurement** feature.

The default selection on the E9020 setup for the **Electrode** type is **Standard**. Keep the selection **Standard** if using a probe with protruding 5.0 square centimeter electrodes or select **Flush** if using a probe with flush 0.5 square centimeter electrodes.

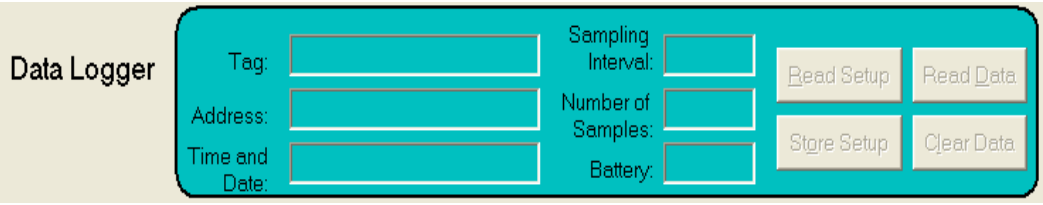
The **Transmitter Test** command button is enabled for **Online** connections. It sends requests to the transmitter and displays returned data in the **Answer** text field if the communication is successful.

8. If using data loggers, first make a complete list of the IDs (Address), **Tags** and descriptions to be used. This will help organize and manage sites.

   Note: The ID (address) of the data logger is independent of the address of the transmitter to which it is connected. The data logger communicates with a transmitter irrespective of the transmitter address. The ID (address) of the data logger is allocated by this software or from the Mate or Mate II during configuration of the data logger in order to segregate the different sets of data.

9. The **Microcor Tools** software allows the direct connection from a PC to a data logger, (this may be used ONLY in an electrically safe area). Alternatively, the data loggers can be programmed and data retrieved with the intrinsically safe Mate or Mate II instrument programmed in Micromate mode or with a Checkmate DL programmed for Microcor Systems, then the data can be transferred to the PC in the safe area.

10. When using a direct PC-to-data logger connection, the data logger screen below is used for configuration and data retrieval after the **Com Port** # is enabled in the **Data Logger Communication** section in the **Site/Communications** tab.



Setup Commands:

Read Setup command button – reads and displays the data logger setup and status information. Use this command to check the settings of the data logger before the data transfer.

Store Setup command button – reads the **Tag** and **Sampling Interval** settings from the **Transmitter** section and stores this information to the **Data Logger**. It will also set the data logger ID equal to the selected **Address**, and the data logger real-time clock to match the computer date and time.

Note: Make sure the computer is set to the correct regional settings and time zone in the Control Panel (Classic View).

Data Commands:

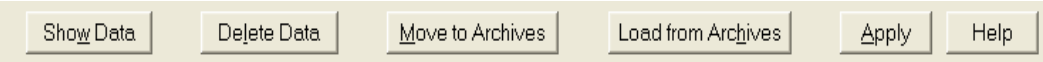
Read Data command button – reads the collected corrosion information from the data logger and stores it in the computer.

Clear Data command button – use this command to delete the data logger memory.

When using the Micromate to configure the Microcor Data Logger, see the section on **Configuration of Data Loggers with Micromate**. Refer to the Checkmate DL User Manual for instructions on configuring Microcor Data Loggers with Checkmate DL.

Other Commands:

This section is used to handle history information; display, delete, move, and load data from archives.



Show Data command button – opens the **Microcor Tools – History Viewer** (see the **Retrieving and Plotting Data (History Viewer)** section for more details).

Delete Data command button – deletes the corrosion data stored for this location.
Move to Archives command button – moves the data file to an "archives" folder. Archive files have automatically assigned names. For example, the archive file of location Address 15, created on 13 May, 2003 is: ch15_13May03.dat. See separate section on **Archiving**.

Load from Archives command button – use this command to load data from archives or import data from previous versions of Microcor. Then use the **Show Data** command to display the information graphically. This command can also be used to import data from other Microcor files (on the hard drive or floppy disk).

Note: Data files (*.DAT) that are imported do not include probe reading interval or probe span details. This must be separately added on the Config/DL Transfer screen. This information is stored in the file (*.SET) of the original data folder.

11. At this point the settings for the current instrument are complete. For the next instrument select new **Address** and repeat steps 1 to 10.

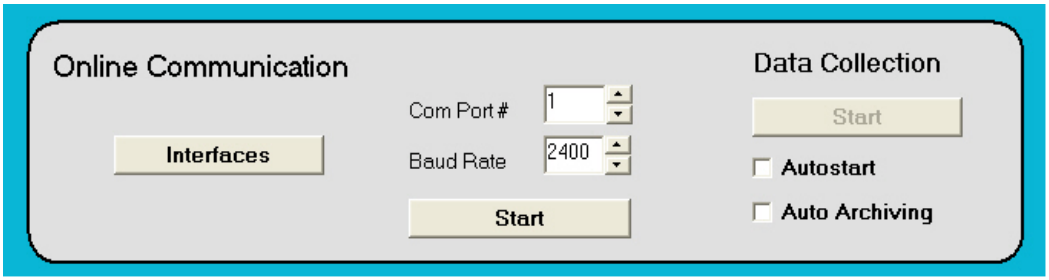
Note: The entries may be made for all of the instruments before saving the settings. However, saving the settings after the entries for each location avoids the chance of losing the data accidentally. To save the configuration on the hard disk, select the **Site/Communications** tab and click the **Save** command.

Chapter 3
Online Data Collection

Starting and Stopping Data Collection

For online data collection, use the **Online Communication** section in the **Site/Communications** tab.

Note: It is important to ensure that the "**Hibernate**," "**System Standby"** and "**Turn off hard disks**" on the Windows Power Options is turned to "**Never**" so data collection will not be interrupted on **Online** systems. Windows Power Options can be found on the Control Panel (Classic View) of the Windows Operating System.



1. Select the **Com Port #** being used on the computer.

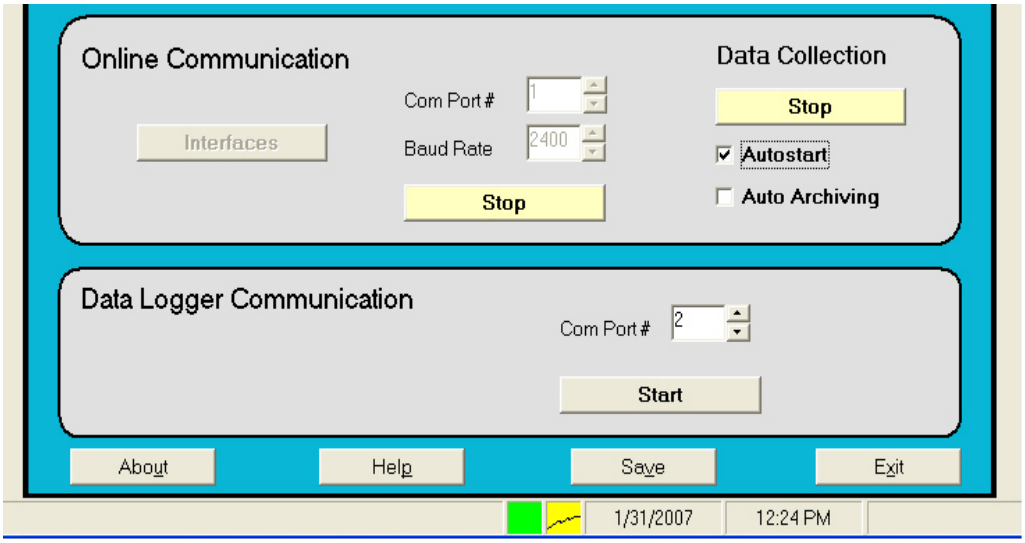
2. Select the baud rate. This depends on the RS232/RS485 converter being used. For MA-1000 converter select 300 baud rate; for any other standard converters select 2400 baud rate.

3. Click the **Start** command button to turn the communication on. At this point the program commences polling the **Online** connected transmitters. Real-time information from the transmitters is displayed in the **Data Display** tab. Use this view for troubleshooting and checking the operation of the transmitters and the RS485 bus.

   Note: Ensure that the Microsoft Windows "Turn off hard disks", "System standby" and "System hibernates" are disabled when setting up **Online Communication**.

4. Click the **Start** command button in the **Data Collection** section to start collecting data from the transmitters to their respective data files. One solid green indicator and one flashing green/yellow indicator will appear on the status bar to indicate that the program is collecting data (see images below). If the solid green indicator starts to blink red and gray, then it is indicating that the corrosion rate level of at least one unit has surpassed the set alarm level on the **Rate/Alarm Settings** area. The **Parameter 3** of the unit(s) in alarm status (at the **Data Display** screen) will turn red and the **Event Log** will display detailed information of the unit(s). Click on the blinking alarm indicator to acknowledge the alarm. This will stop the blinking and reset the status bar indicator to solid red and the **Parameter 3** of the unit(s) in alarm to yellow. This means there is an ongoing alarm, and it is acknowledged. When the

alarm is turned off or when the corrosion rate resets to below the alarm rate, the indicator light will turn to solid green. If a unit enters an alarm status and resets prior to user acknowledgement, red indicator will change color to blinking green and gray and will reflect this on the **Event Log**; hence it is highly recommended that the **Event Log** is inspected regularly.



Normal Operation

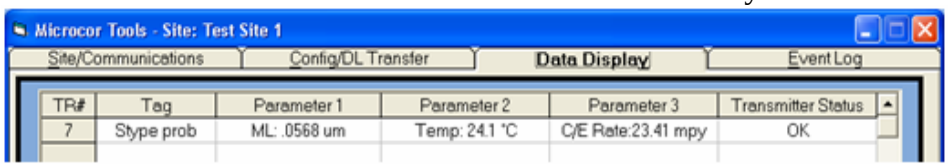
Status Bar:

First Icon – Group Alarm - Solid green, indicates active data collection and corrosion rate level below alarm value

Second Icon - Transmitter Status - Flashing green/yellow, indicates reading of probe transmitters is active (normal)

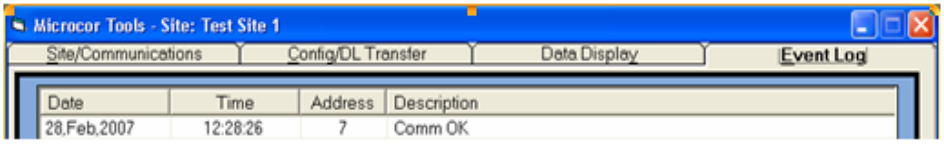
Data Display Screen:

Corrosion rate level below alarm value so no alarm activity shown.



Event Log Screen:

Communication is okay.



Active Alarm

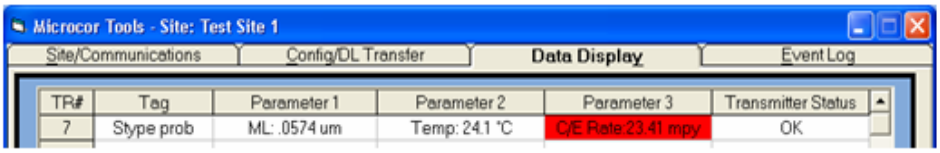
Status Bar:

First Icon – Group Alarm - Flashing red/gray, indicates corrosion rate level of at least one unit has surpassed the set alarm value

Second Icon - Transmitter Status - Flashing green/yellow, indicates reading of probe transmitters is active (normal)

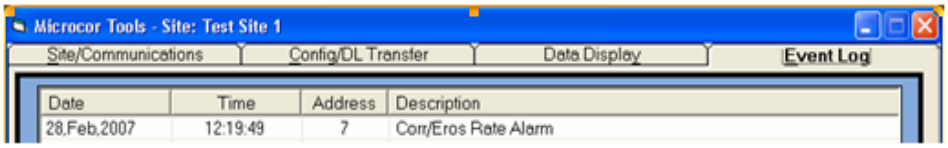
Data Display Screen:

Parameter 3 will turn red to indicate active alarm status.



Event Log:

Alarm status is recorded on the **Description** area.



Alarm Acknowledged

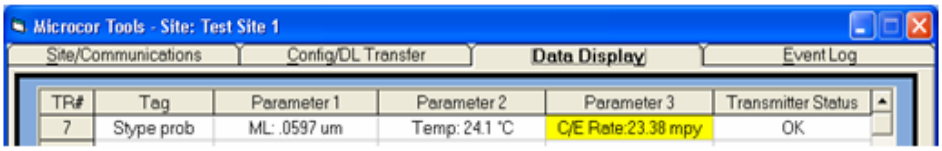
Status Bar:

First Icon – Group Alarm - Solid red, indicates user acknowledged the alarm but the alarm condition still persists. This will turn to solid green when the alarm is turned off or when the conditions return back to normalcy

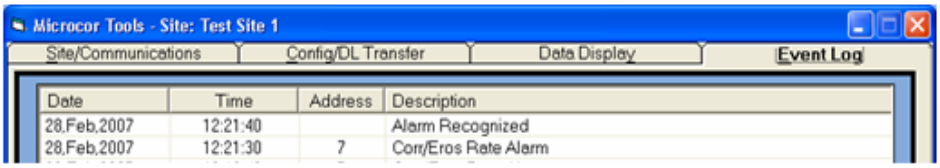
Second Icon - Transmitter Status - Flashing green/yellow, indicates reading of probe transmitters is active (normal)

Data Display Screen:

Parameter 3 will turn yellow to indicate user acknowledgment of tripped alarm.



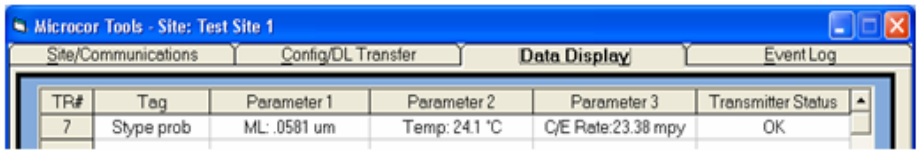
Event Log:
Description changed to show "Alarm Recognized" status.



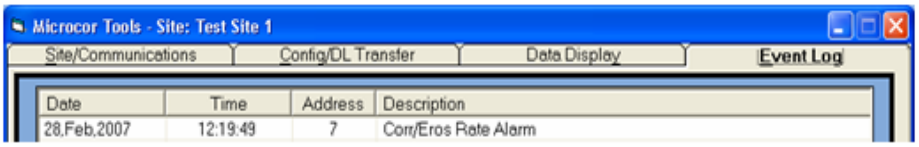
Alarm Reset Prior to User Acknowledgement

Status Bar:
First Icon – Group Alarm - Flashing green/gray, indicates alarm was tripped but the condition returned to normalcy
Second Icon - Transmitter Status - Flashing green/yellow, indicates reading of probe transmitters is active (normal)

Data Display Screen:
Parameter 3 will turn not show any change of status



Event Log:
Description will record the date, time and ID of the unit(s) which was in alarm status

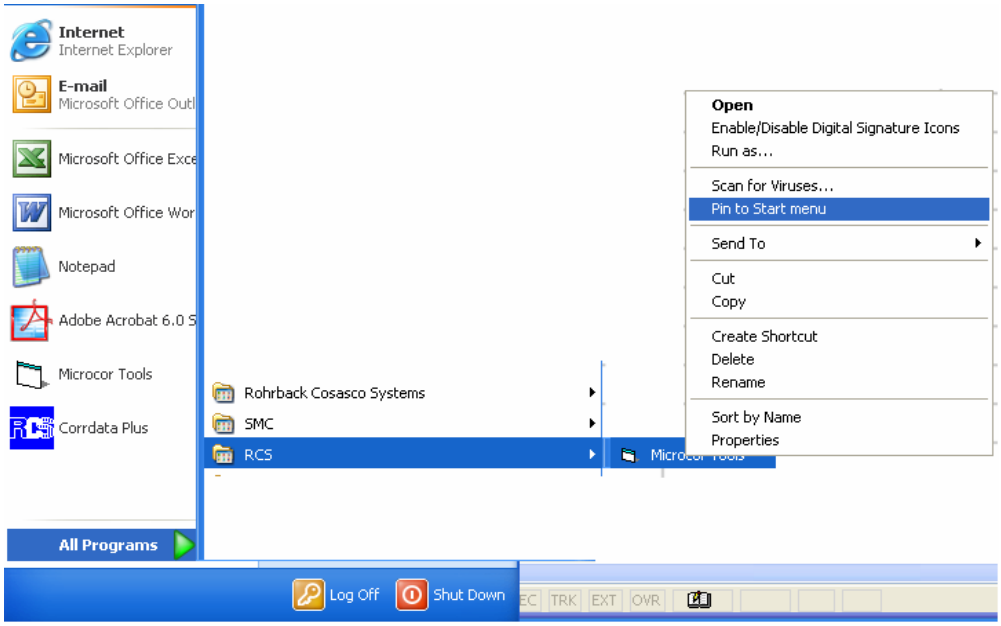


5. When using Microcor Tools for on-line monitoring, it should be set up in the Microsoft Windows Startup folder and the **Autostart** checkbox should be checked. This ensures that the program will restart automatically and commence the online communication and data collection when the computer is restarted after maintenance or power failure.

Note: Users may require Power User or Administrative privileges to perform the below operations and should always consult your organization's IT Department for assistance and permissions.

To add Microcor Tools to the Windows Startup folder, copy the Microcor Tools icon form the desktop and paste it in the **C:\Documents and Settings\All Users\Start Menu\Programs\Startup** directory.

Alternatively, users may navigate to **Start → All Programs → RCS and** right click on **Microcor Tools** and select **Pin to Start Menu** as shown below:



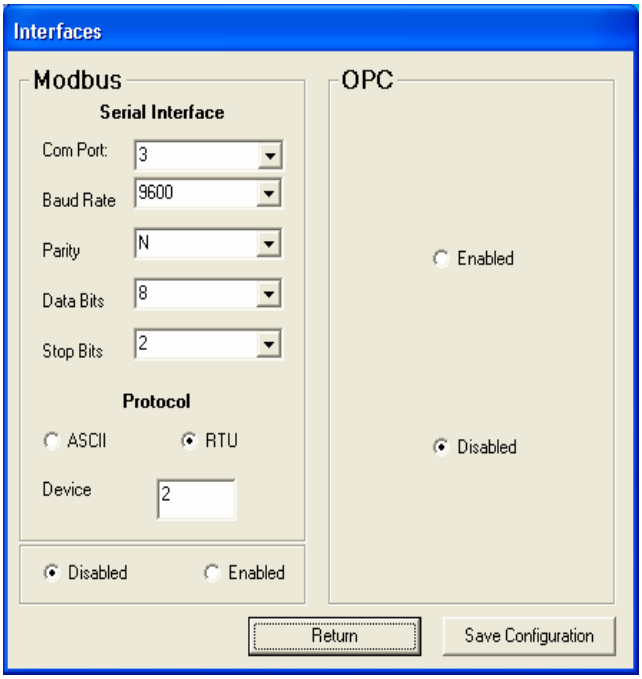
6. The **Auto Archiving** feature is designed for computers or embedded computers as in the RCS IIU with limited storage resources. If the **Auto Archiving** is selected, when a site collects 2MB of data (approximately 48,620 readings or 67 days of continuous data collection (temperature data collection enabled) at a sampling interval of 2 minutes), the data file is automatically transferred into the archives folders replacing the previously stored data file, and the current data file will be cleared for collection of new data.

   Note: When **Auto Archiving** is enabled, Microcor Tools initiates automatic archiving when the file reaches its limit, previous automatically stored archives will be deleted. This process will not delete any manually archived files.

7. On the **Microcor Tools - Output Interface** release used on the RCS Intelligent Interface Unit, users can set up data communication with other computers. Click the **Interfaces** button to enter the setup screen shown below. Select the desired method of transfer and configure the fields if necessary. Click the **Enabled** radio button and **Save Configuration** button prior to pressing **Exit**.

Typically, only one interface, either Modbus or OPC, is used at a time. However, it is possibly to use both output interfaces at the same time, if required. Microcor Tools acts as a Modbus slave, and its address is set in the device window. The Com port should be set to correspond to the hard wired connection to the Modbus Master. If Microcor Tools is supplied on an RCS computer or embedded PC, the Modbus communications may be via RS 232, two- or four wire-RS 485, according to the unit ordered. Most commonly Remote Terminal Unit (RTU) binary protocol is used for economy of transmission data length. This, and the baud rate, parity, data bits, and stop bits should be set to match the Modbus master with which it is communicating. The Modbus addresses and data format is shown in Appendix 2).

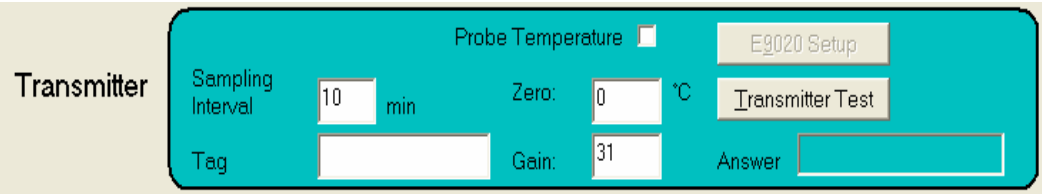
The OPC Interface is a Microsoft standardized database interchange protocol which uses the computers network interface card (NIC) to communicate via the network. Also included with the **Microcor Tools Software - Output Interface** option is a simple OPC Client Test Utility which enables testing of the OPC output. See Appendix 3 for further details.



8. To view the collected data, switch to **Config/DL Transfer** screen and change the **Address** to the desired ID. Click on the **Show Data** command button to open the **Microcor Tools – History Viewer** (see the **Retrieving and Plotting Data (History Viewer)** section for more details)). An alternate method is to switch to **Data Display** screen and double click on the desired **Tag** to open the **Microcor Tools – History Viewer**.

Testing Channels

Individual transmitter channels may be checked with the **Transmitter** section on the **Config/DL Transfer** screen.



1. Click the **Transmitter Test** command button.

2. Successful transmission will return raw data and display it in the **Answer** text field.

   If communication with the selected transmitter fails, a "No Answer" error message will be generated in the status bar located at the bottom of the screen.

   If an error message occurs, check the following:

   - All connections are correct.
   - The correct **Com Port #** is being used and that the **Online Communication** has been started on the **Site/Communications** screen.
   - The transmitter **Address** (or Instrument #) is correct.
   - There is power to the transmitter.
   - The system is connected properly.

3. Repeat the test by pressing **Transmitter Test** again.

4. Repeat as required for other RS485 locations.

Chapter 4
Data Collection from Data Logger

1. For data loggers installed in non-hazardous areas, the configuration and data retrieval may be done directly with a portable PC.

2. For data loggers installed in hazardous areas, the configuration and data retrieval is made with the intrinsically safe Corrdata Mate or Mate II Data Transfer units running Micromate software or with the Checkmate DL handheld instrument programmed for Microcor Systems. Collected data is then transferred to the PC in the safe area. In this case, the Micromate and Checkmate DL emulate each data logger so that the software program retrieves collected data from them as it would from a data logger.

   Note: To configure a Microcor Data Logger from a Micromate or a Checkmate DL, follow the recommended suggestions below:

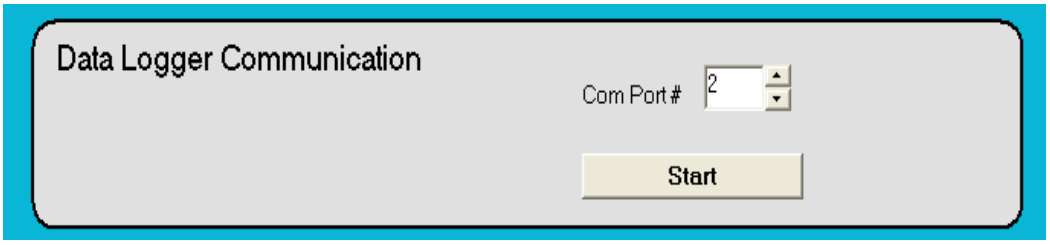
   1. If a collection of data loggers exist on the PC, prepare a list that contains each data logger and its respective **Address** and **Tag** in advance to making the trip to the installed area.

   2. Once in the field, connect the Micromate/Checkmate DL to the Microcor Data Logger and perform the programming with the information corresponding to the pre-made list from above. Refer to the Micromate and Checkmate DL User Manuals for more details.

Configuration of Data Loggers with PC

1. Connect the PC or portable PC to the data logger with the cable P/N 748204 for data logger Model ML 9500A or cable P/N 748243 for data logger Model ML 9500B.

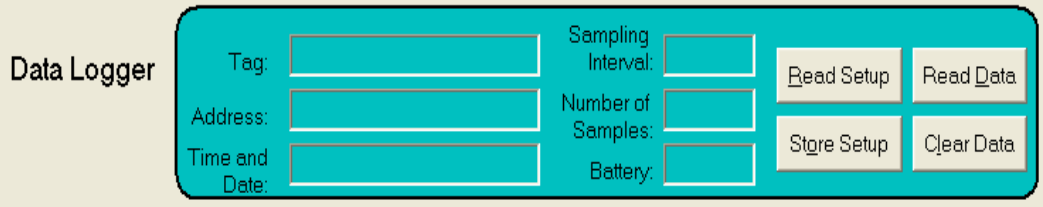
2. Select the **Com Port #** being used on the computer and click the **Start** button.



3. Switch to the **Config/DL Transfer** screen and select the **Address**. Click the **Data Logger** checkbox in the **Connection** section and configure the transmitter as described previously.

4. Click the **Store Setup** command button in the **Data Logger** section. This will populate the text fields in the **Data Logger** area accordingly. Verify all the text fields including **Time and**

Date, and **Battery** for accuracy. **Read Setup** will interrogate the data logger and display stored values and will enable verification of these stored values.



If the data loggers are in a hazardous area, they will need to be configured with the Corrdata Mate or Mate II programmed with the Micromate software or Checkmate DL programmed for Microcor Systems. Make a note of the configuration information as this will have to be entered again into the Micromate or the Checkmate DL.

Data Collection from Data Loggers with PC

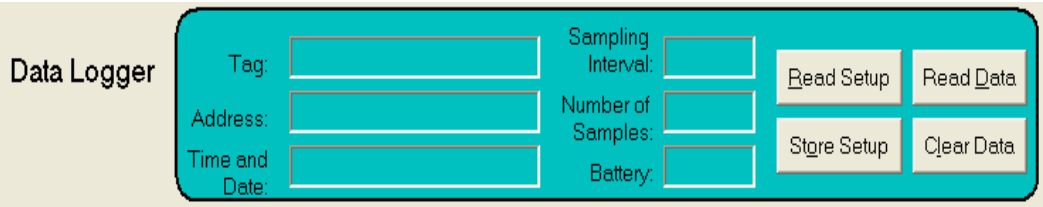
1. Connect the portable PC to the data logger communications port with cable P/N 748204 for data logger Model ML 9500A or cable P/N 748243 for data logger model ML 9500B.

2. Switch on the portable PC and start the **Microcor Tools** program.

3. Select the **Site** from the **Existing Sites**. Select the **Com Port #** from the **Data Logger Communication** section and click S**tart** command button.

4. Switch to the **Config/DL Transfer** screen. Select the desired **Address**.

5. Click the **Read Setup** command button in the **Data Logger** section. This will interrogate the data logger and display the resulting information in the text fields.



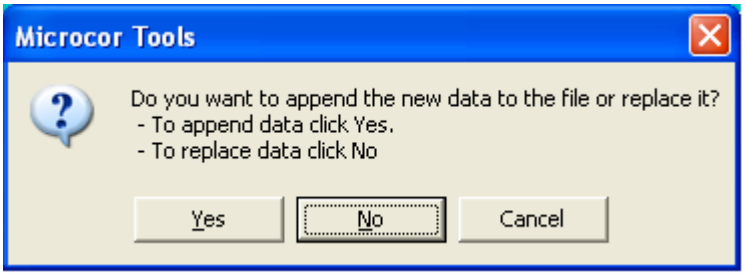
The time and date shown in **Time and Date** box should correspond to the current time. If there is an error or drift in the time this can be corrected with the **Store Setup** command.

The **Battery** text field should read **OK**. If it reads **Replace**, then the battery needs to be replaced and the data MUST be cleared after collection for data collection to recommence.

Important Note: When the data logger battery gets too low to drive the transmitter, it shuts off the transmitter, and sets the Battery Replace flag. At this point there may still be enough power in the battery to drive the data logger for some time and even allow downloading of data. The battery must be replaced in order for the transmitter to run again. If the data is not cleared after the battery is replaced, the flag will not be reset and no data will be collected from the transmitter.

The **Sampling Interval** text field should correspond to **Sampling Interval** in the **Transmitter** section.

6. Click the **Read Data** button. If data from this location has already been collected, the following message will appear:


Microcor Tools
Do you want to append the new data to the file or replace it?
- To append data click Yes.
- To replace data click No
Yes
No
Cancel

- Press **Yes** to add the new data onto an existing file. This is the normal method if the data in the data logger is deleted after it is collected each time, in order to speed data transfer. It also prevents reaching the maximum storage capacity in the data logger at which time the data collection stops.

- Press **No** if all of the data in the Micromate/Checkmate DL is to replace an existing file. This should be used if the data in the data logger is NOT cleared each time it is read. In this case the existing file is automatically archived.

- Press **Cancel** to exit the **Read Data** function.

Note: The Microcor Data Logger will store up to 8000 readings before collection memory is fully allocated; at this point, collection of data will halt until data is cleared from memory.

Note: The normal recommended practice is to collect data and then clear the data in the data logger. The new data is then appended to the stored data file on the PC and the data transfer time is minimized.

After a selection has been made, a counter in the status bar indicates the number of samples to be transferred. Status bar will read **End of Transfer** when the data is successfully transferred from the data logger to the **Microcor Tools** program.

7. Verify that the data is transferred correctly - click the **Show Data** command button to display the data with the **Microcor Tools – History Viewer**.

8. It is recommended to clear the data in the data logger at this point to reduce the data transfer times on later downloads. Click the **Clear Data** command button to perform this action.

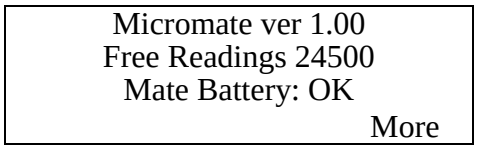
9. Repeat the steps 1 to 8 for each of the data loggers from which data is collected. Make sure that the correct **Address** is selected for each data logger before loading the data.
   Note: The data logger checks the battery status during the maximum-load time intervals. If the battery voltage is low, a battery **Replace** status is set in non-volatile memory. In this state the data logger does not power the transmitter and does not collect data. Other functions and commands such as **Read Setup**, **Store Setup**, **Load Data**, and **Clear Data** are not affected. The data logger will remain in this state until **Clear Data** command is executed after replacing the battery.

Configuration of Data Loggers with Micromate

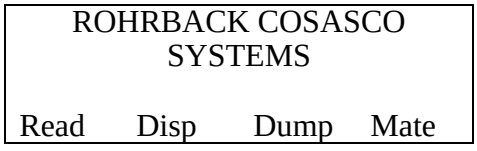
First, connect the Microcor transmitter and data logger as described in their operating manuals. Ensure that the battery in the data logger is connected.

Note: The data logger enclosure is rated explosion proof, with an intrinsically safe RS 232 communications port. When operating the data logger in a hazardous area, a hot work permit will be required to install or replace the battery which is housed in the explosion proof enclosure.

1. Verify that the Corrdata Mate or Mate II is programmed with the Micromate software for use with Microcor Data Loggers. The Corrdata Mate programmed as a Micromate will appear as follows when switched on:



   If the Corrdata Mate is programmed for operation with Corrosometer and Corrater probes and data loggers, the screen will appear as follows when switched on:

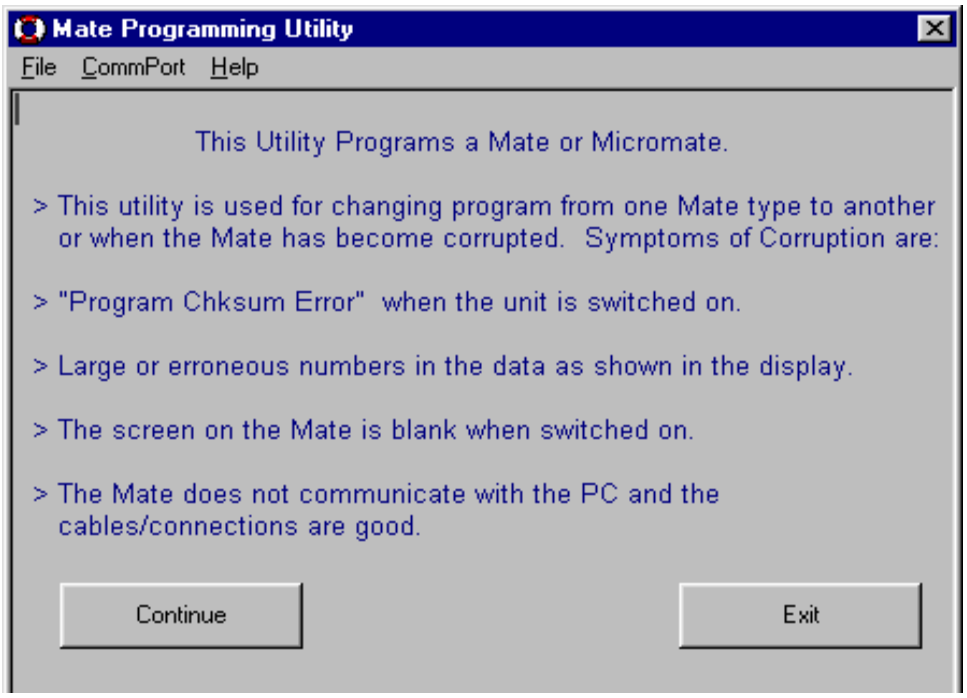


2. Setting up the Corrdata Mate or Mate II with Micromate software is described in steps 3 to 11. If Micromate is already installed on the Corrdata Mate or Mate II, skip to step 12.

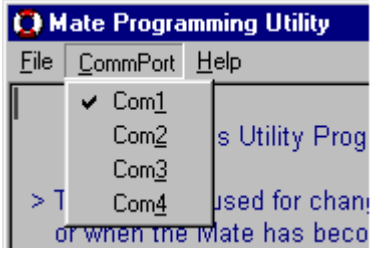
The Corrdata Mate or Mate II is software programmable. For reasons of memory limitations, the Corrdata Mate or Mate II is programmed either for use with the Corrosometer and Corrater range of probes and data loggers, or with the Micromate software for use with the Microcor range of data loggers. The **Mate Programming Utility** allows the program in the Corrdata Mate to be changed back and forth if required. This process is also used to set the Time Zone in the Micromate which is required for the correct date and time function of the **Microcor Software** application.

3. Make sure that the **Mate Programming Utility** has been installed on the PC.

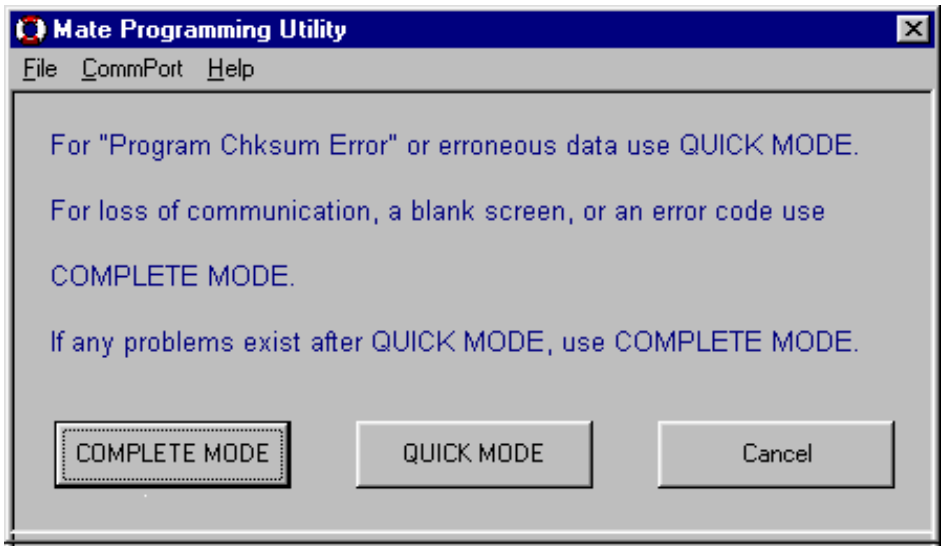
4. To start the **Mate Programming Utility**, click **Start → All Programs → RCS Programs → Mate Programming Utility**. The following screen will appear.


Mate Programming Utility
File
CommPort
Help
This Utility Programs a Mate or Micromate.
> This utility is used for changing program from one Mate type to another or when the Mate has become corrupted. Symptoms of Corruption are:
> "Program Chksum Error" when the unit is switched on.
> Large or erroneous numbers in the data as shown in the display.
> The screen on the Mate is blank when switched on.
> The Mate does not communicate with the PC and the cables/connections are good.
Continue
Exit

5. From the main menu select **CommPort**, and click on the **Com** port you will be using for communication with the Mate. This will usually be Com 1 or Com 2.



6. Click on the **Continue** button.


Mate Programming Utility
File CommPort Help
For "Program Chksum Error" or erroneous data use QUICK MODE.
For loss of communication, a blank screen, or an error code use
COMPLETE MODE.
If any problems exist after QUICK MODE, use COMPLETE MODE.
COMPLETE MODE
QUICK MODE
Cancel

7. Select the **Quick Mode** unless any of the problems described on the image above have occurred. A pop-up screen will then ask if the Mate is already programmed as a Mate or a Micromate. This is because the key selections required to set up a Mate are different from setting up a Micromate.

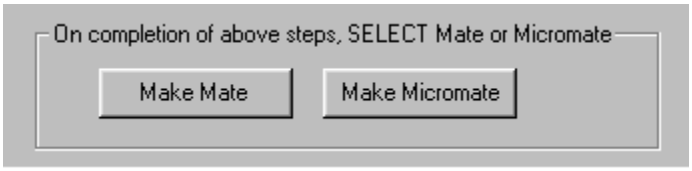
8. Click the **Mate** or **Micromate** button as appropriate. If the unit is already programmed as a Corrdata Mate, which is how new units are shipped, selecting the **Mate** command button will display the following instructions:

    1. Connect Mate to COM Port 1 using Serial Adapter Cable
    2. Turn on Mate
    3. Press F1 (Read) on Mate
    4. Press F2 (MODE) on Mate

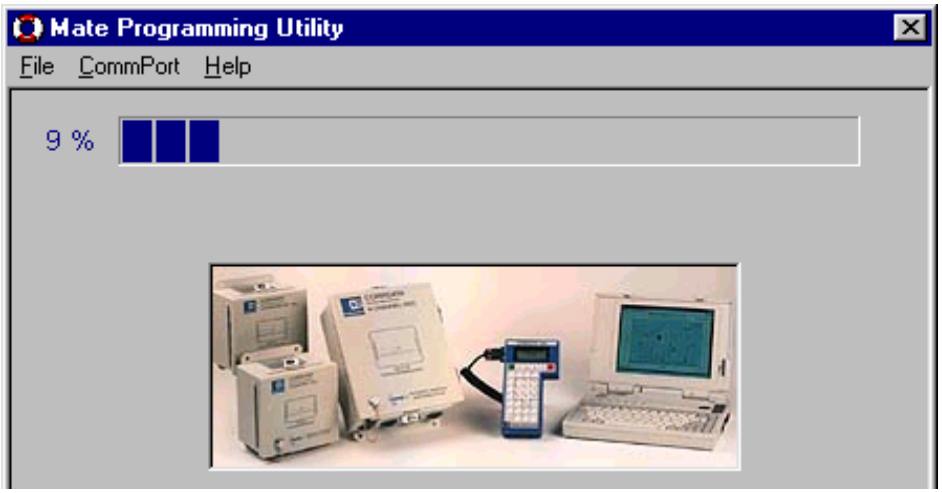
    If the unit is already programmed as a Micromate, the following instructions will be shown:

    1. Connect Micromate to COM Port 1 using Serial Adapter Cable
    2. Turn on Micromate
    3. Press F4 on Micromate (one or two times) until F4 reads OK
    4. Press F4 (OK) on Micromate
    5. Press F4 (Mate) on Micromate
    6. Press F2 (Prog/Mate) on Micromate

9. Follow the instructions above and then select the button to program the Mate as Mate or Micromate. In this case we want to choose **Make Micromate**.



A Scroll bar on the PC will indicate the progress on the programming and a scrolling of addressing being programmed on the Mate will show on the Mate screen.



Note: If the scroll bar operates on the PC but there is no scrolling of addresses on the Mate, then the Mate is not being programmed. This may be due to a bad connection or a wrong Com port. The PC is not able to indicate such a problem as there is no handshaking between the PC and the Mate during programming.

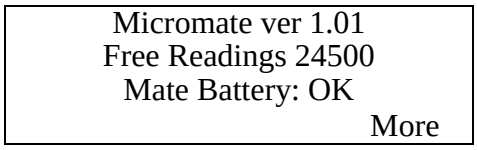
The Mate will beep and indicate when the programming is complete.

10. The programming of the Mate with the **Micromate** software also sets the **Time Zone** information into the Micromate automatically from the computer. The correct time zone is required as the underlying data format uses a GMT time reference.

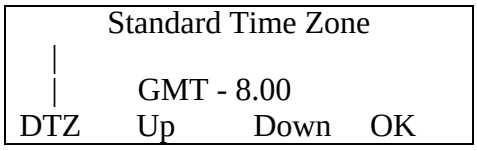
Note 1: If you are using the **Mate Programming Utility** to set the **Time Zone** into the Micromate software, make sure that the time on your computer is correct and that the Regional Settings in the Control Panel (Classic View) of Windows are correct.

Note 2: You can also program the **Time Zone** manually on the Micromate on startup.

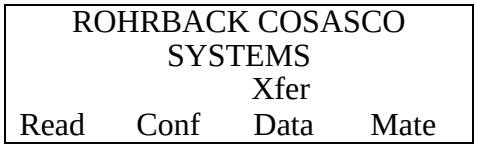
11. Switch on the **Micromate**. The following screen will appear:



The number of free readings should be 24500 if the Micromate memory is completely clear. If the number is less than 24500, and previously collected data has already been transferred to the PC, then it is best to clear the memory to obtain maximum data collection capacity. See step 13 below. If the Battery indicates **LOW** then the Micromate batteries need changing. Press **More (F4)**.



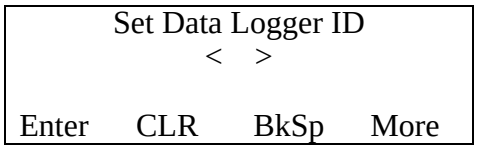
If the Micromate has been programmed from the PC, and the PC is correctly set up for your regional settings and time, then this screen should show the correct time zone with the number of hours from GMT (+ numbers of hours for locations East of London, - numbers of hours for locations West of London). Standard Time Zone indicates there is no daylight savings. Daylight Time Zone indicates that Daylight Savings Time is in operation. If any of these settings are incorrect, check your computer and verify time and date settings are correct. On the Micromate, the number of hours east or west of London may be changed with the **Up (F3)** and **Down (F4)** keys. The Standard and Daylight Savings may be toggled with the **F1** key. Press **More (F4)**. This will display the following screen.



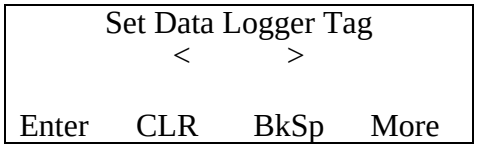
12. To clear the data memory in the Mate, if required, press **Mate (F4)**, and **Clear Mate (F1)**. A warning will appear. Press **Yes (F1)** to complete memory clearance.

13. Produce a listing of the configuration information for the data loggers.

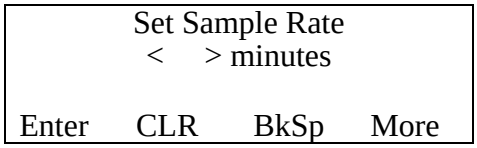
14. Connect the Micromate to the first data logger to be configured with the cables supplied. From the Micromate main screen above press **Conf (F2)** to display the screen:



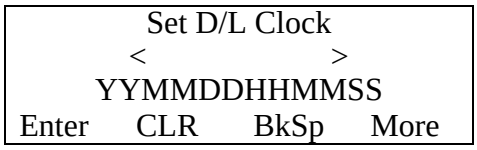
15. Enter the **Logger #** for the **ID**. This is the same as the **Address #** in the software. The **Clear (F2)** clears the complete entry. **BkSp (F3)** backspaces one character to enable correction. Press **Enter (F1)** to complete the entry. This brings up the following screen:



16. Enter the **Tag** number for this location, up to 12 characters, and press **Enter (F1)** to complete the entry. This brings up the following screen:



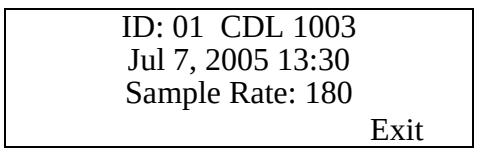
17. Enter the **Sample Rate** or the reading frequency required. For a data logger, where battery consumption is a consideration, a reading interval of 3 hours or 180 minutes usually suits well. This gives a battery life of around one year, and still provides eight readings a day. The minimum recommended setting is 30 minutes. The maximum setting is 1440 minutes (one day). Press **Enter (F1)** to complete the entry. This brings up the following screen:



18. Enter the date and time in the format indicated, in order to set the reference time into the data logger.

    YY is two digits for the year
    MM is two digits for the month
    DD is two digits for the day
    HH is two digits for the hour (24 hour clock)
    MM is two digits for the minute
    SS is two digits for the seconds (or just enter 00)

    Press **Enter (F1)** to complete the entry and configure the data logger. The Micromate will indicate configuration is in progress and then display the configured information such as follows:



Note: When configuring the data logger with the Micromate**,** it is not necessary to clear any data that may be left in the data logger. This is done automatically by the Micromate.

19. Leave the data logger to collect data. It will take its first reading at the end of the sample period.

20. Repeat steps 15 to 19 on the other data loggers that are to be configured.

Data Collection from Data Loggers with Micromate

1. Connect the Micromate to the data logger communications port with the supplied cable.

   Note: There are separate cables for the ML 9500A and the ML 9500B. Take care to use the correct cable. Otherwise communication will not work.

2. Switch on the Micromate, and press **F4** twice to clear the initial screens.

3. Press **Read (F1)** to display the following screen:

ID: 25 CP 1002			
Jul 7, 2005 13:30			
Read Stat	Read Data	Set Clock	Exit

4. If the battery on the data logger has expired, the Micromate will indicate that there is no communication. In this case, change the data logger battery. When the battery runs low, the data logger will first switch off power to the transmitter, set the Battery Status to LOW, and stop taking readings. However, it will have enough power left for some time to allow communication with the Micromate.

   WARNING: If the battery status indicates low, the data logger memory must be cleared after data collection to reset the Battery Low flag and re-enable reading of the transmitter. See step 5 below. If the memory is not reset, the data logger will not restart taking readings from the transmitter.

   Note: Changing the data logger battery in a hazardous area will require a hot work permit; make sure the local atmosphere is free of explosive gases.

   After replacing the battery, re-read the data logger as described in steps 2 and 3. Replacing the battery will require the data logger clock to be reset. This will be indicated on the screen:

ID: 25 CP 1002			
Clock Not Set!			
Read Stat	Read Data	Set Clock	Exit

Press **Set Time (F3)** and enter the current date and time. Otherwise the default date is Jan 1, 2000. This function is also used if required to correct the time in the data logger.

Set D/L Clock			
<		>	
YYMMDDHHMMSS			
Enter	CLR	BkSp	More

Press **Enter (F1)** to show the screen in Step 3 above.

5. It is then important to press **Stat (F1)** to check the status of the data logger, specially the battery status. This would give a screen such as the following:

Jul 7, 2005 13:30			
Readings: 245			
Sample Rate: 180			
More			Exit

Press **More (F1)**:

Batt: OK (or Low)			
Mem: OK (or BAD)			
Trans: OK (or BAD)			
			Exit

WARNING: **If the battery status indicates Low, collect the data in the data logger as described below, and then the data logger memory MUST be cleared (see step 8) to allow data collection to re-commence.**

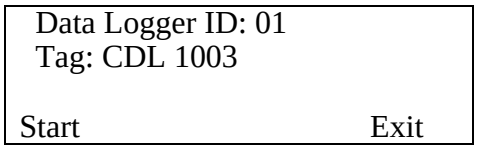
Memory Bad indicates a problem in the data logger memory requiring repair.

Transmitter Bad indicates that the data logger is not communicating with the transmitter. It suggests a problem with the interconnecting cable or transmitter.

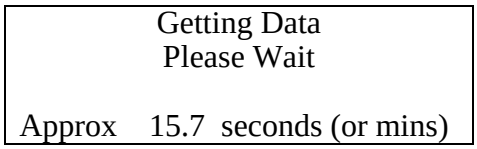
Press **Exit (F4)** to return to the screen:

ID: 25 CP 1002			
Jul 7, 2005 13:35			
Read Stat	Read Data	Set Clock	Exit

6. Press **Data (F2)** to commence collecting data. If the data logger has not had its **Logger #** or **ID** not set (for example if it was configured directly from a portable PC using the previous MS 9000 version 1.8 software), the Micromate will request setting of an **ID** (**Address**) and **Tag**. If the data logger has already had the **Logger #** or **ID** set, then it will go directly to a screen similar to the following.

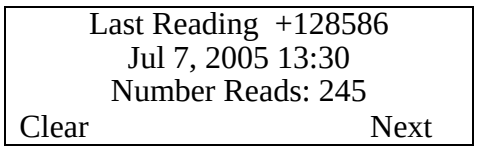


If there is insufficient memory for downloading the data, an error message "No Memory Space for Readings" will be displayed. At this point the existing data in the Micromate will have to be transferred to the PC and the memory in the Micromate cleared. If the memory is sufficient, the Micromate will display the following:



The screen will indicate how long it will take for the data to transfer to the Micromate, and will count down as it goes.

7. When data collection is complete, the screen will display the last reading, the date and time of the last reading, and the number of readings taken, similar to the following:



The last reading confirms that the instrument is producing good numbers. If the reading is near +262144, then the probe has almost expired and needs changing. If this is the case, then the data logger will need to be powered down and then re-configured after the probe replacement and powering-up again in order to set the correct time and date.

8. Press **Clear (F1)** to clear the data memory in the data logger. This MUST be done if the Battery Status indicated LOW and the battery has been changed. If the battery has not been changed and you do not wish to clear the memory press **Next (F4)**. If you press **Clear (F1)**, a warning screen will ask for confirmation to clear the logger. Press **YES (F1)** to accept or **No (F4)** to reject.

9. Repeat steps 1 to 8 for each data logger from which data is to be collected.

Note: Clearing the data in the data logger minimizes the data collection time and maximizes the amount of data logger data that may be collected with the Micromate before it must be transferred to the PC. The data logger will store up to 8000 readings before it stops recording.

Transferring Collected Data from Micromate to PC

1. Connect the Micromate to the PC communications port with the supplied cable.

2. Switch on the portable PC and start the **Microcor Tools** program.

3. From the **Site/Communications** tab in the **Microcor Tools** software, select the appropriate site from the **Existing Sites** area and set the **Com Port** # if necessary in the **Data Logger Communications** section, then press the **Start** command button.

4. From the **Config/DL Transfer** tab select the **Address** (data logger ID) of the first data logger for which information is to be collected from.

5. Switch on the Micromate and press **(F4)** twice to go to the main screen. Then press **Xfer Data (F3)**. A screen such as the following will appear:

   Data Logger ID: 01
   Tag : CDL 1003

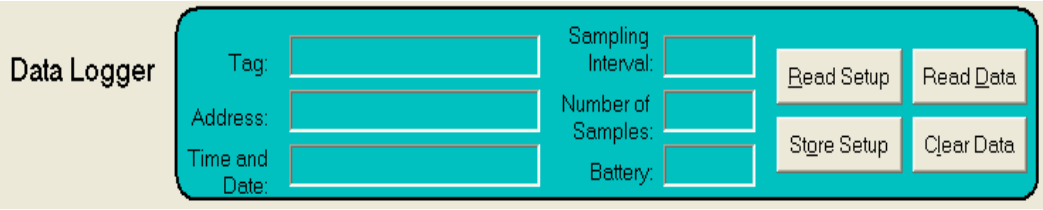
   Start Next Prev Exit

   The first **Data Logger #** or **ID** will be the lowest number in the list. Check that the **Data Logger #** or **ID** on the Micromate and the **Address** on the PC match. If not press **Next (F2)** or **Prev (F3)** until they do match. Press **Start (F1)** and the following screen will be displayed:

   Ready To Transfer
   Data using Microcor
   Software from RCS
   Exit

   At this point the Micromate is emulating the selected data logger.

6. Click the **Read Setup** command button in the **Data Logger** section. This will check if the communication port is valid and show the setup information.



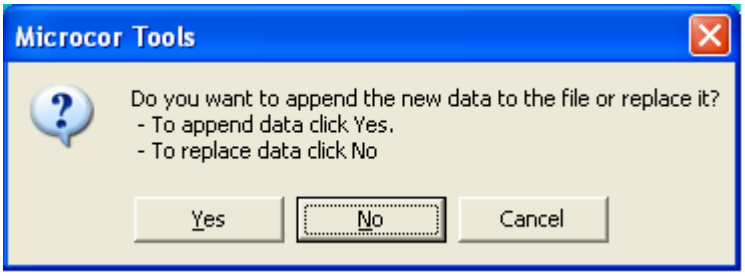
The time and date shown in the **Time and Date** text field should correspond to the time the data was downloaded from the data logger.

The **Battery** text field should read **OK**. If it reads **Low**, then the battery in the data logger should be changed and memory cleared.

The **Sampling Interval** text field in the **Data Logger** section should correspond to **Sampling Interval** text field in the in the **Transmitter** section.

Note: The **Store Setup** and **Clear Data** are not functional when working with the Micromate even though the status bar at the bottom of the screen indicates operation. These are only operational when working directly with the PC and the data logger. When using the Micromate, the configuration and clearing of the data logger is done by the Micromate.

7. Click the **Read Data** command button. If data from this location has already been collected the following message appears:


Microcor Tools
Do you want to append the new data to the file or replace it?
- To append data click Yes.
- To replace data click No
Yes
No
Cancel

- Press **Yes** to add the new data onto an existing file. This is the normal method if the data in the data logger is deleted after it is collected each time in order to speed data transfer. It also prevents reaching the maximum storage capacity point in the data logger at where data collection stops.

- Press **No** if all of the data in the Micromate is to replace an existing file. This should be used if the data in the data logger is NOT cleared each time it is read. In this case the existing file is automatically archived.

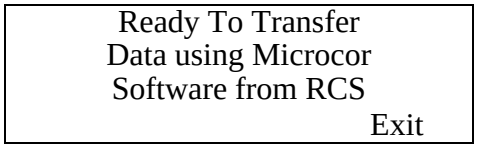
- Press **Cancel** to exit the **Read Data** function.

Note: The Microcor Data Logger will store up to 8000 readings before collection memory is fully allocated, then the collection of data will halt until data is cleared from memory.

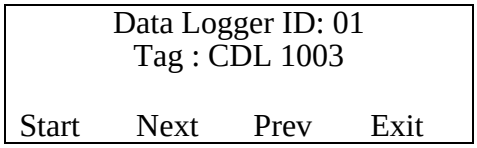
After a selection has been made, a counter in the status bar indicates the number of samples to be transferred. Status bar will read **End of Transfer** when the data is successfully transferred from the data logger to the **Microcor Tools** program.

8. Verify that the data is transferred correctly - click the **Show Data** command button to display the data with the **Microcor Tools – History Viewer**.

9. At the end of the transfer, press **Exit** on the Micromate screen shown below:



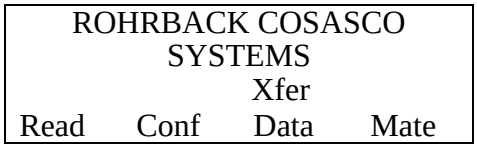
This will return to the previous screen:



10. Press **Next (F2)** to select the next **Data Logger #** or **ID** for data transfer from the Micromate to the PC. Select the corresponding **Address** on the PC and repeat steps 6 to 9 above. Repeat these steps to transfer data from other data loggers.

Note: An asterisk (*****) after the ID number on the Micromate indicates that this ID has been transferred to the PC. This allows confirmation of which ID's have been transferred and which have not.

11. Clear the memory in the Micromate once all of the data is properly transferred and verified. This is done from the main screen shown below, by pressing **Mate (F4)** and **Clear Mate (F1)**:



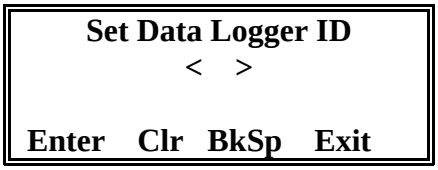
The Micromate is now ready for the next data collection from the data loggers.

Note: The data logger checks the battery status during the maximum-load time intervals. If the battery voltage is low, a battery **Replace** status is set in non-volatile memory. In this state the data logger does not power the transmitter and does not collect data. Other functions and commands such as **Read Setup**, **Store Setup**, **Load Data**, and **Clear Data** are not affected. The data logger will remain in this state until **Clear Data** command is executed after replacing the battery.

Configuration of Data Loggers with Checkmate DL

This section explains the manual configuration of Microcor probes (attached to a Microcor Data Logger) onto the Checkmate DL. Once the Microcor Data Logger information is properly configured into the Checkmate DL, Data Loggers will need to be programmed. See the Checkmate DL User Manual for more details.

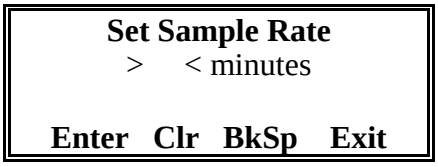
Connect the Checkmate DL to the Microcor Data Logger; from the **Standby** display, press **Conf (F2**) to proceed to the **Set Data Logger ID** display:



Enter a the desired ID number from 0 to 99 and press **Enter (F1)** to proceed to the **Set Data Logger Tag** display. If the ID selected has already been configured, the user will be notified; if continued with the configuration, all previously accumulated data will be erased from the Data Logger.

In the **Enter Data Logger Tag** display, enter up to twelve (12) alpha/numeric characters to uniquely identify the monitoring location. This can be a tag number, location or process name. Pressing **Clr (F2)** clears a previously entered ID. Pressing **BkSp (F3)** backs up one space for each time it is pressed so that a change can be made. Pressing **Exit (F4)** returns to the **Standby** display.

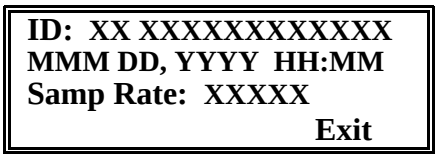
Press **Enter (F1)** to proceed to the **Set Sample Rate** display:



Set the desired sample rate and press **Enter (F1)** to complete the configuration.

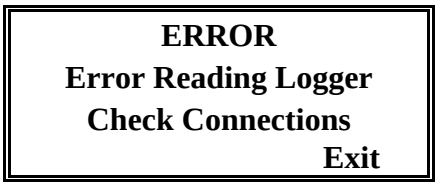
Data Logger is successfully configured when the Checkmate DL displays the screen below. Date and Time settings are automatically programmed into the Data Logger using the programmed

Checkmate DL time and date. Press **Exit (F4)** to return to the **Standby** screen from the following display:



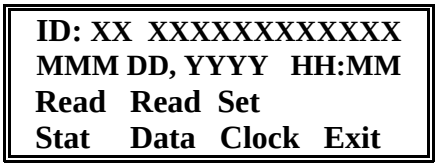
Note: It is necessary to set the correct DAYLIGHT or STANDARD time zone into the Checkmate DL to accurately Date and Time stamp Data Logger readings. Refer to the AVAILABLE MEMORY SPACE AND STANDARD TIME ZONE section for more details.

If following error messages appear on the Checkmate DL during the Data Logger configuration, verify the Checkmate DL is properly connected to the Data Logger.



Set Data Logger Time

The Data Logger Date and Time is automatically set when the unit is configured using the Checkmate DL. However, it is possible to update or reset the time if required or if the display indicates "**CLOCK NOT SET!**" To set the Data Logger Time and Date, connect the Checkmate DL to the Data Logger with the provided adapter cable connector. From the **Standby** screen, press **Read (F1)** to proceed to the following display with the attached Data Logger information:



Press **Set Clock (F3)** to update the Data Logger with the set time of the Checkmate DL.

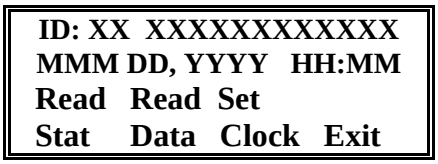
Note: It is necessary to set the correct DAYLIGHT or STANDARD time zone into the Checkmate DL to accurately Date and Time stamp Data Logger readings. Refer to the AVAILABLE MEMORY SPACE AND STANDARD TIME ZONE section for more details.

Data Collection from Data Loggers with Checkmate DL

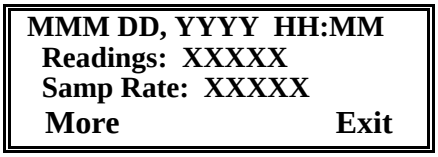
The Checkmate DL is designed to configure and gather data from all Microcor Data Loggers (ML 9500A and/or ML 9500B). The following section will explain the data collection procedure from Microcor Data Loggers.

Read Data Logger Configuration and Status

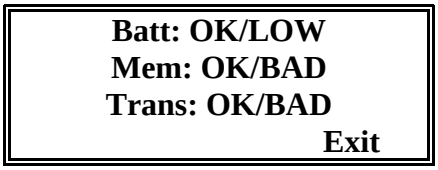
Configurations already set into the Data Logger are easily read with the Checkmate DL. Connect the Checkmate DL to the Data Logger with the provided adapter cable connector. From the **Standby** screen, press **Read (F1)** to proceed to the following display with the attached Data Logger information:



Press **Read Stat (F1)** to display the Data Logger time, number of readings and the sample rate as shown below:

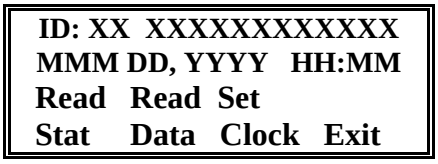


Press **More (F1)** to continue to the next display which shows the battery, memory and transmission information as shown below. Battery status will show **OK** or **LOW**. Memory and Transmission will show **OK** or **BAD** depending on their status.

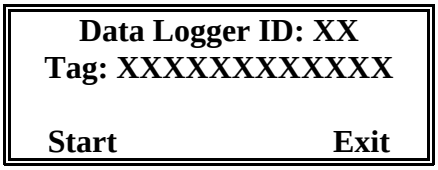


Reading / Clearing Data from Microcor Data Loggers

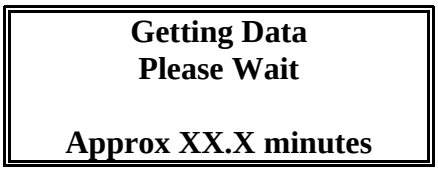
To read a Data Logger, connect the Checkmate DL to the Data Logger with the provided adapter cable connector. From the **Standby** screen, press **Read (F1)** to proceed to the following display with the attached Data Logger information:



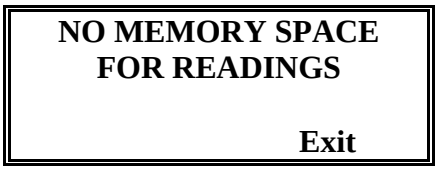
Press **Read Data (F2)**; Checkmate DL will perform a series of internal checks and proceed accordingly. First, Checkmate DL will check whether the ID is properly assigned. If the ID is not properly assigned, it will prompt the user to set the Data Logger ID and the Tag information. It will then determine if any readings for this ID are stored in the Checkmate DL. If any data for the ID exists in the Checkmate DL, then the user will be prompted to either **Overwrite (F1)** or **Abort (F4)**. Overwriting will delete the existing data for that ID and replace it with the new data being read. Once these internal checks are performed and any issues resolved, Checkmate DL will proceed to the following screen:



Press **Start (F1)** from the above screen to begin the read process. The Checkmate DL will show the following screen during data transfer.



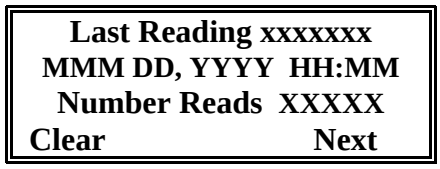
If "**NO MEMORY SPACE FOR READINGS**" screen appears (shown below), then the Checkmate DL memory will need to be cleared before transferring the data. It is recommended that ALL existing data on the Checkmate DL be transferred to a PC prior to erasing ANY data. Refer to the section **Clearing the Checkmate DL Memory** on the **Initializing Checkmate DL to Work with Microcor Systems** chapter.



Once the data is successfully read and transferred it is displayed as shown below. Users can at this time elect to delete the Data Logger content if desired.

Note: All data stored for this ID on the Checkmate DL will be erased if "Clear" button is pressed.

Press **Clear (F1)** to clear Data Logger readings or **Next (F4)** to return back to the Data Logger information screen without clearing the readings.



WARNING! It is recommended to clear the data in the Data Logger after transfer to the Checkmate DL. This reduces the amount and time of data transfer for future downloads. The data is then appended to the previous data when transferring the data from the Checkmate DL to the PC. Refer to the **Transferring Collected Data from Checkmate DL to PC** section.

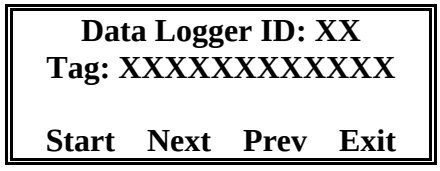
Transferring Collected Data from Checkmate DL to PC

Data Logger data is downloaded to the PC using the provided Microcor® Tools Software program. Connect the Checkmate DL instrument to the 9 pin serial port on the PC using the provided cable. If there is no serial port in the computer, use the included serial-to-USB converter cable to complete the connection. Make sure to set the correct COM port number on the Microcor Tools Software program **Data Logger Communication** area (in most cases this will be COM 1, however verify this in the device manager).

Checkmate DL Data Transfer Procedure

From the **Standby** screen, press **Data (F3)** to advance to the following display:

Press the **Start (F1)** to proceed to the next screen. Use **Next (F2)** and **Prev (F3)** to navigate the ID list (0 – 99) and select the desired ID to transfer data (shown below).

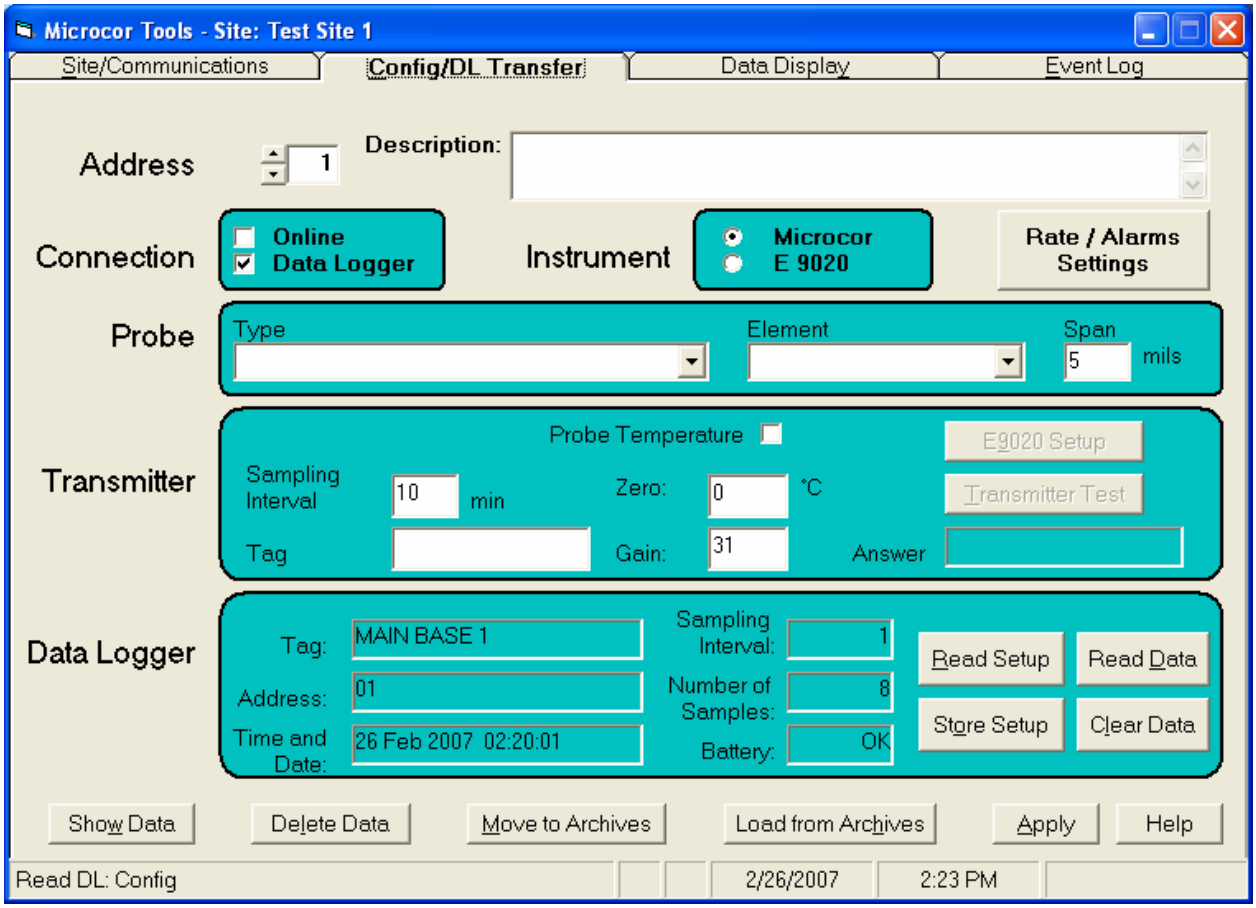


Once the ID is selected, press **Start (F1)**. Following screen will appear:

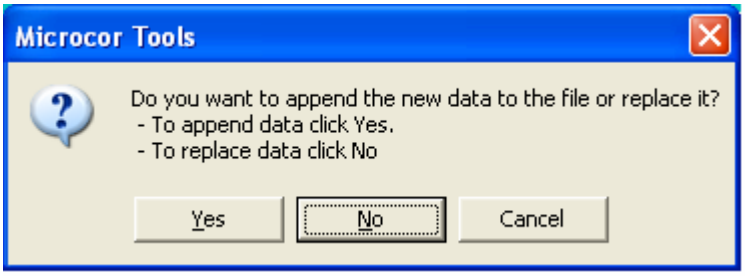
Ready to Transfer
Data using Microcor
Software from RCS
Exit

Note: At this point make sure that the data (ID of the Data Logger) set in the Checkmate DL to be transferred corresponds with the **Address** selected in the Microcor Tools Software before transferring the data.

Data is now ready for transfer from the Checkmate DL to the PC. On the Microcor Tools Software program, select the **Site** and navigate to the **Config/DL Transfer** screen, select **Data Logger** as the **Connection** type and **Microcor** as the **Instrument** (see image below). Click the **Read Data** command button to begin the transmission. It is also possible to click the **Read Setup** command button to transfer the configuration data of the Data Logger to the **Data Logger** section on the **Config/DL Transfer** screen (shown below).



If data already exists for the chosen address, following dialogue box will appear:


Microcor Tools
Do you want to append the new data to the file or replace it?
- To append data click Yes.
- To replace data click No
Yes
No
Cancel

- Press **Yes** to add the new data onto an existing file. This is the normal method if the data in the data logger is deleted after it is collected each time in order to speed data transfer. It also prevents reaching the maximum storage capacity point in the data logger at where data collection stops.

- Press **No** if all of the data in the Micromate is to replace an existing file. This should be used if the data in the data logger is NOT cleared each time it is read. In this case the existing file is automatically archived.

- Press **Cancel** to exit the **Read Data** function.

  Note: The Microcor Data Logger will store up to 8000 readings before collection memory is fully allocated, then the collection of data will halt until data is cleared from memory.

After a selection has been made, a counter in the status bar indicates the number of samples to be transferred. Status bar will read **End of Transfer** when the data is successfully transferred from the data logger to the **Microcor Tools** program. During the data transfer, the following screen will be displayed on the Checkmate DL:

Data Transfer in Progress!
xxxxx Readings Left
Exit

The number of readings (xxxxx) counts down as the data is transferred to Microcor Tools. Upon successful transmission, Checkmate DL will show the following screen:

Data Transfer Done!
Exit

Press **Exit (F4)** to return to the Data Transfer screen to choose another ID for data transfer.

Note: Information from only one Data Logger can be transferred at a time, when transferring information of more than one Data Logger, **change the Address on the Microcor Tools Software program for each transfer** so that all data is not transferred only to one ID address.

In case of any error messages displayed on Checkmate DL, check connections between Checkmate DL and the PC, make sure that Microcor Tools Software program is running and that the correct COM port is checked.

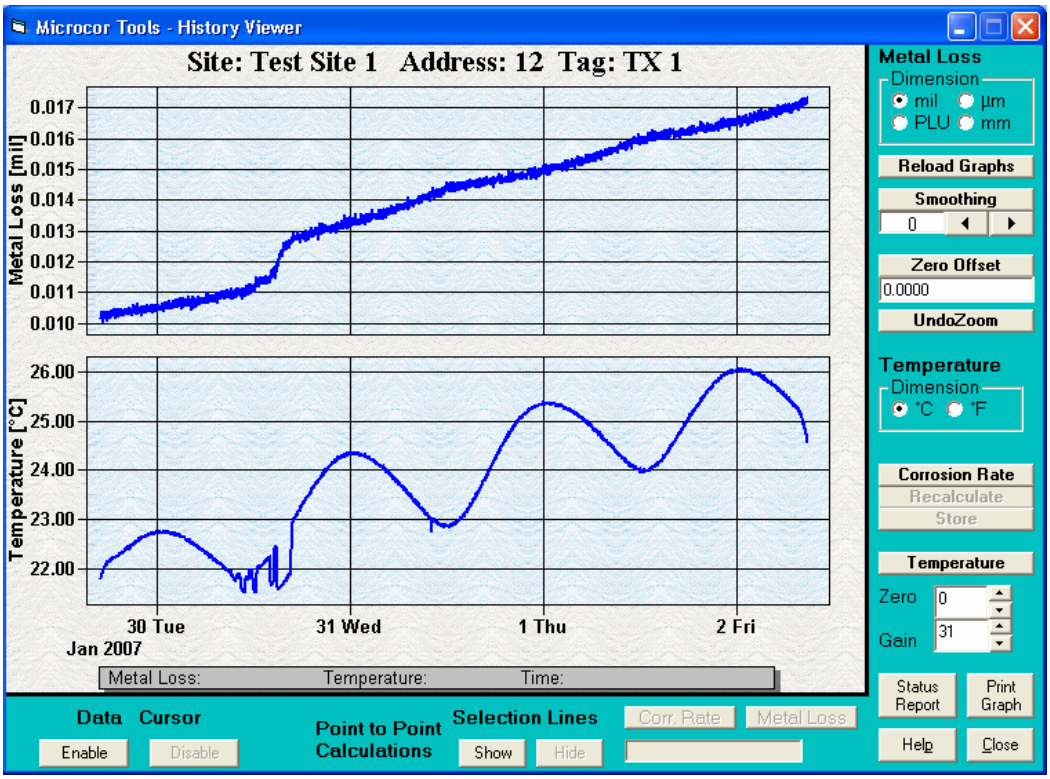
If data is still not transferred after checking the connection between the PC and Checkmate DL, please see the Troubleshooting section for further help.

Chapter 5
Retrieving and Plotting Data (History Viewer)

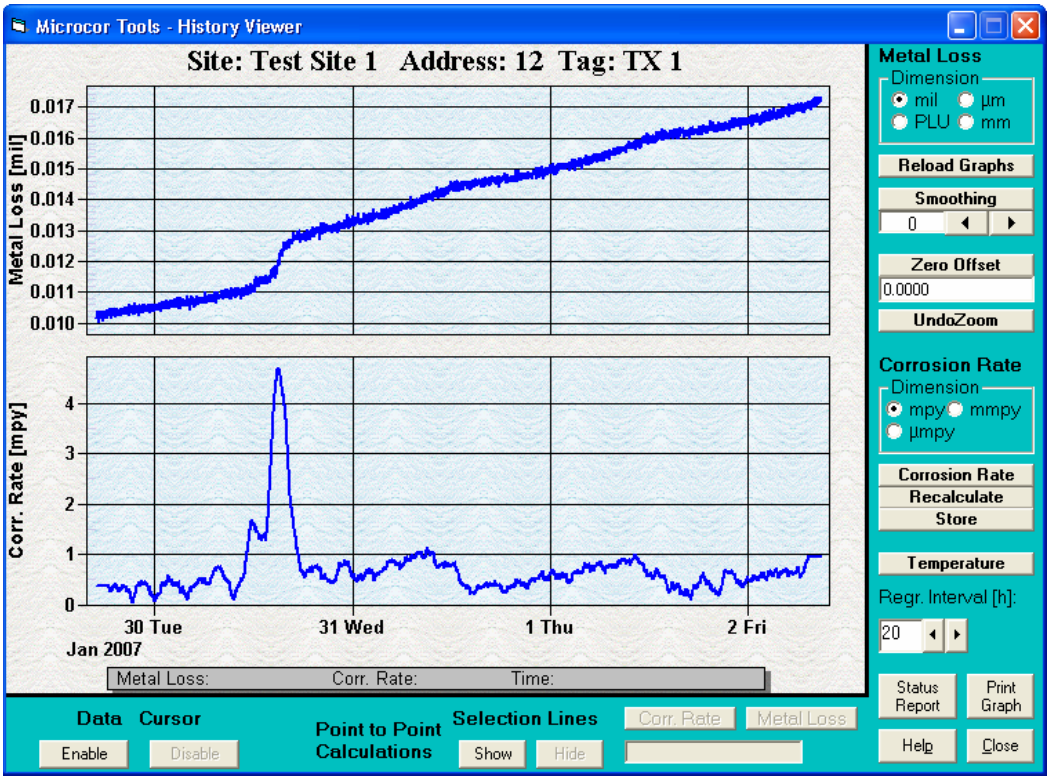
Microcor Tools allows retrieving and plotting of corrosion data. **Microcor Tools – History Viewer** can be used to view data collected **Online** or by **Data Logger** connection methods.

To open the **Microcor Tools – History Viewer** (graph feature), select the site from the **Site/Communications** tab, select the **Address** from the **Config/DL Transfer** tab, and click the **Show Data** command button**.**

Microcor Transmitters (MT 9485, MT 9485A)



In the screen shown above, the top graph is the **Metal Loss** and the bottom graph presents the probe **Temperature** (when applicable). The bottom screens show the **Corrosion** or **Erosion Rate** for the same set of data when the **Corrosion** or **Erosion Rate** button is selected.



To show the corrosion rate graph, click the **Corrosion** or **Erosion Rate** command button.

To show the probe temperature graph, click the **Temperature** command button.

Note: The **Temperature** graph will open as the default bottom graph if the transmitter supports temperature monitoring capabilities and if the **Probe Temperature** check-box is selected; otherwise the graph area will remain blank (to view the **Corrosion** or **Erosion Rate** graph, **Corrosion** or **Erosion Rate** command button must be pressed. It will not open as a default graph). Data loggers do not support temperature measurements.

Use the upper **Dimension** box (top right-hand corner of the **Microcor Tools – History Viewer** screen) to select the **Metal Loss** Y-axis units in **mils**, **µm**, **mm** or Probe Life Units (**PLU**).
Use the lower **Dimension** box (middle right-hand side of the **Microcor Tools – History Viewer** screen) to select units of probe temperature in **ºC** or **ºF**.

Corrosion Rate will be in units corresponding to the Metal Loss units that have been selected (Mils per Year (**mpy**) or Micrometers per Year (**µmpy**)) and calculated by linear regression. This **Regression Interval** may be re-adjusted and the Corrosion or Erosion Rate **Recalculated**. The default may suit many online systems but can be changed to optimize noise against sensitivity of the computed corrosion or erosion rate. The **24h Filter** can be enabled at the **Rate/Alarms**

Settings area to reduce the effects of any diurnal (24) thermal noise. The **Alarm Level** units are directly related to the above selected units and can only be changed by the above settings.

Once the settings have been optimized, the rate data may be saved with the **Store** button. When closing the graphical display window (**History Viewer**) you will be asked to save the settings. Select **Yes** to store these settings for automatic application to all new data.

Select (or type in) values for **Zero** and **Gain** to calibrate the measurement. If calibration parameters are unknown for probes and transmitters, select 0 for **Zero** and 31 for **Gain**.

The **Zero Offset** will allow users to change the y-axis reference point to zero (0) by changing the value. This is a helpful feature when conducting tests to graphically view the data from a convenient starting point. It is recommended that this be returned to original value of zero so determination of probe life can be done accurately.

E9020 Transmitter (E9020)

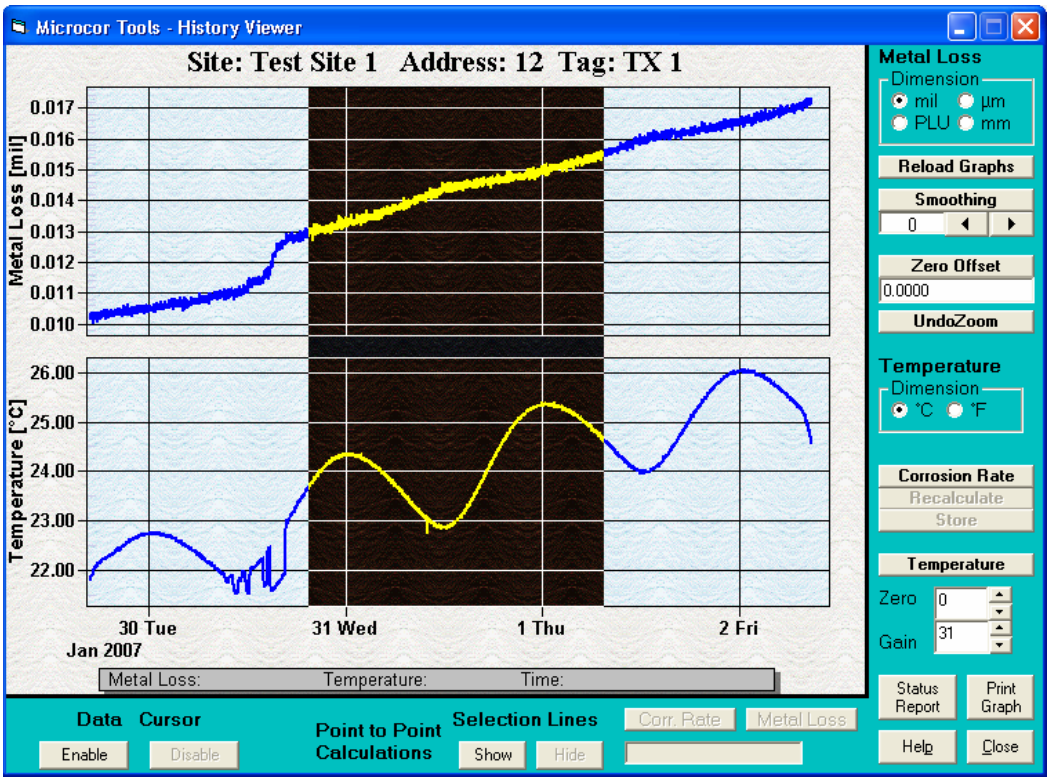
The top graph is the **Imbalance** graph. Use the upper **Dimension** box (top right-hand corner of the **Microcor Tools – History Viewer** screen) to select the Imbalance units in Pit Units (**PitU**) or Microamperes (**µA**).

The bottom graph displays the **Corrosion Rate** (units of **mpy** or **µmpy**) or the **Potential Noise Rate** (**Volt** or **Raw Data**). Both the top and the bottom graphs have same time scale.

Zoom Commands

To select a zoom area:

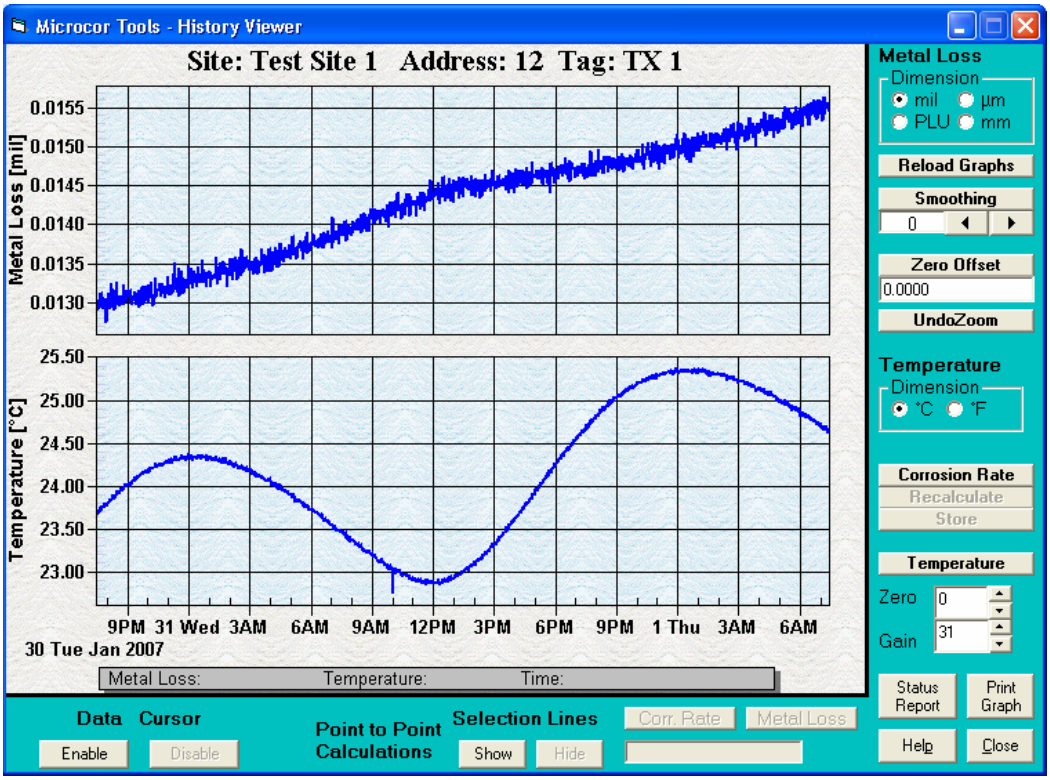
1. Navigate to the graph, press and hold the left mouse button on the starting location;
2. Move the mouse horizontally;
3. Release the button at the desired end location.



Use the **UndoZoom** command button to return to the previous state of the graph.

Note: **UndoZoom** command button will only undo the last nine (9) graphical zoom changes and will adjust the Y-axis unit range to match the maximum ranges of the graphs.

The zoom result from the above graph is shown below:

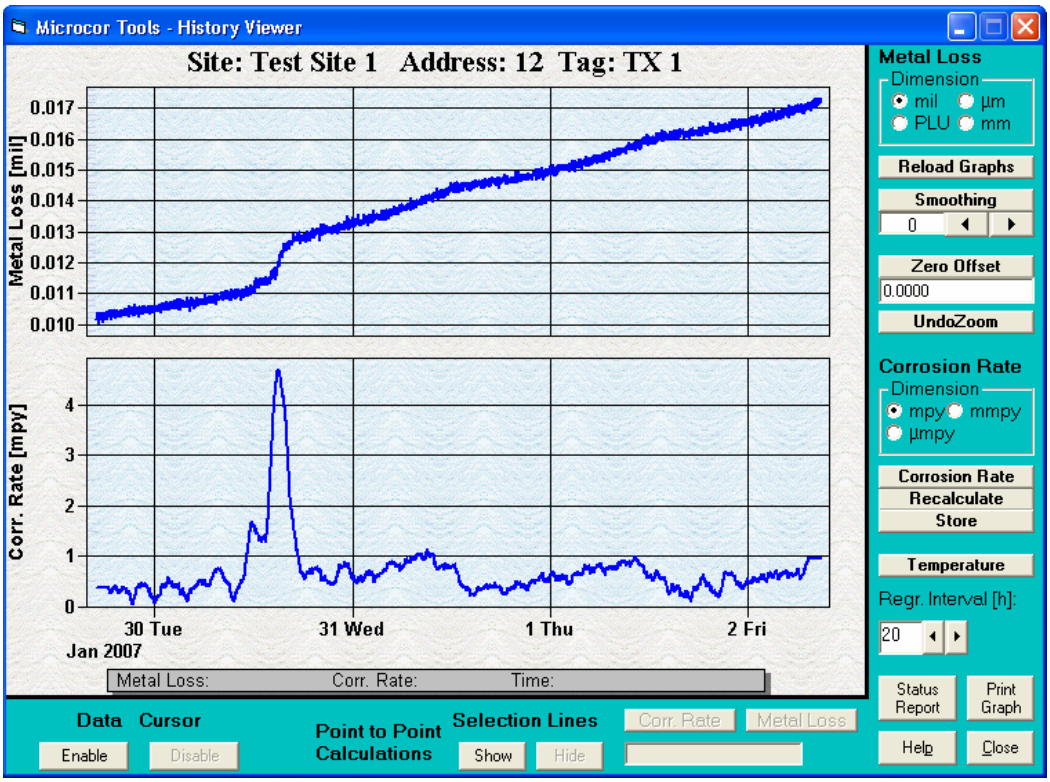


Smoothing is a process by which data points are averaged with their neighbors in a series to blur the sharp edges to depict smoother data points**.** At the default of zero, it plots every data point. The setting is the number of points used in a moving average to smooth the **Metal Loss** data. The maximum setting number is 100. Increase and decrease the number for more or less smoothing of graphs.

Note: This setting does not affect the data used for the Corrosion or Erosion Rate computation, as the **Corrosion** or **Erosion Rate** is computed from the raw data.

Generating a Corrosion or Erosion Rate Graph

To generate a graph of Corrosion Rate against time, press the **Corrosion Rate** command button.

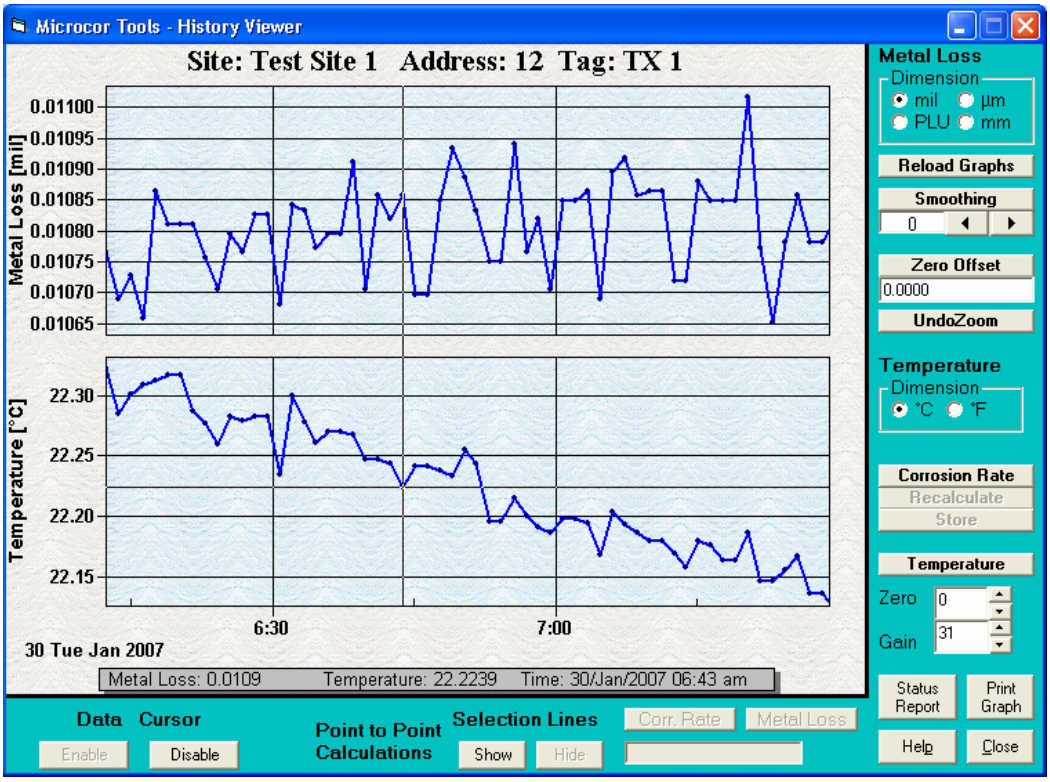


The **Regression Interval [h]** control allows selecting a time interval used to calculate the **Corrosion** or **Erosion Rate** graph (linear regression algorithm).

The Corrosion Rate will be in units corresponding to the Metal Loss units that have been selected in Mils per Year (**mpy**) or Micrometers per Year **(µmpy**), and will be calculated by linear regression on an initial default-running-window of 24 hours (20 hours when the collection time is set to 2 minute intervals). This regression period is displayed in hours and may be re-adjusted and the Corrosion or Erosion Rate re-run with the **Corrosion** or **Erosion Rate** command button. The interval may need to be adjusted to optimize noise versus sensitivity of the rate graph.

Data Cursor

The **Data Cursor** function provides information for an individual data point. The **Enable** command button marks the data points on the graph with dots. Mouse clicking on the data point will refresh the **Metal Loss**, **Temperature**/**Corrosion Rate** (depending on the graph selected) and **Time** readings on the gray bar located in the bottom section of the graph. To disable the **Data Cursor** function, click the **Disable** command button.

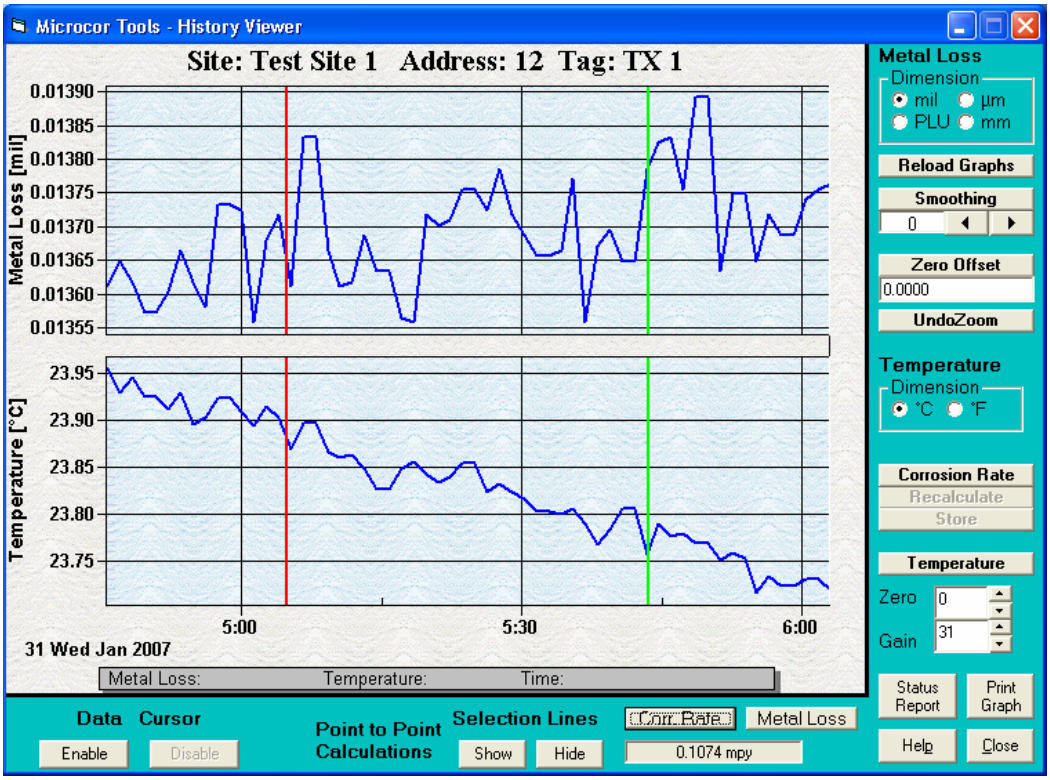


Point to Point Calculations

This function (Metal Loss graphs only) provides metal loss and corrosion rate calculation for a selected time-interval.

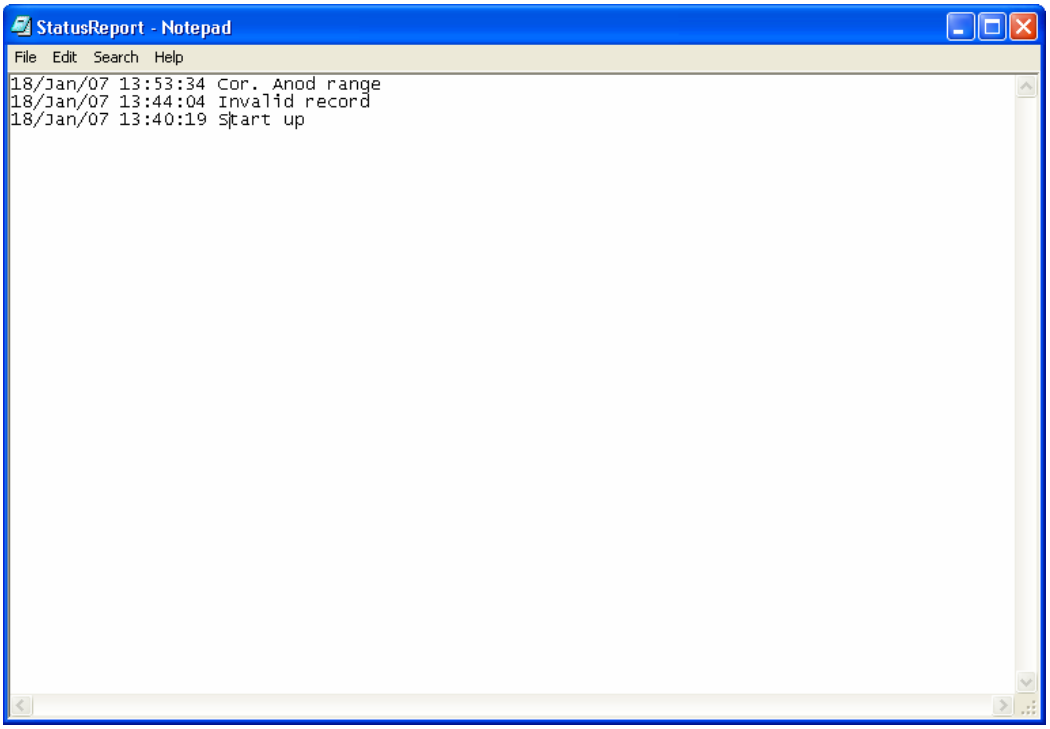
- Click on the **Show** command button under the **Selection Lines** label.
  -Two vertical lines (red and green) will appear on the screen.
- Click and drag the lines to a new position on the graph.
- Click the **Corr. Rate** or **Metal Loss** command buttons for the calculations.

Click the **Hide** command button to disable this feature.



Generating a Status Report

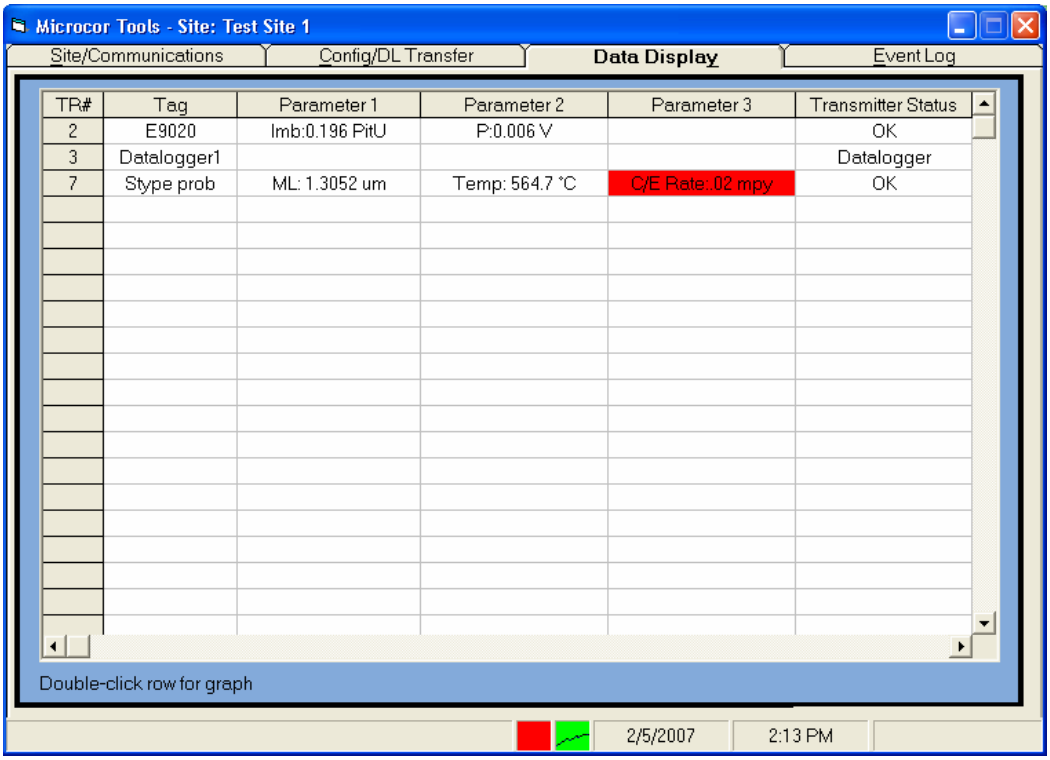
The history file that contains all the corrosion data also contains status codes. These status codes are not shown by the **Microcor Tools – History Viewer** graphs. The **Status Report** command button is intended to search the history file for status codes and to generate a report in standard text format. The command opens the report in the Notepad editor.


StatusReport - Notepad
File Edit Search Help
18/Jan/07 13:53:34 Cor. Anod range
18/Jan/07 13:44:04 Invalid record
18/Jan/07 13:40:19 Start up

Use the Notepad “Print” or “Save As” commands to print or store the report on the hard drive.

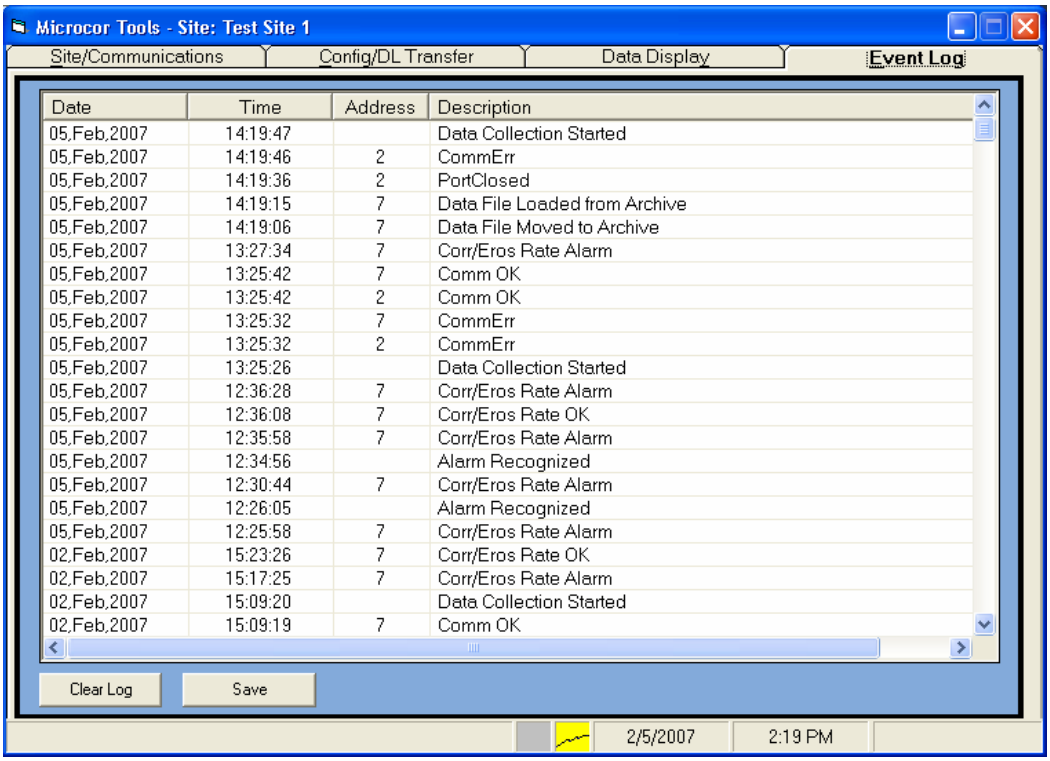
Chapter 6
Real-Time Data Monitoring

The **Data Display** tab is the most convenient global display for on-line systems. It shows current readings and alarm status. Each point on the **Data Display** maybe double-clicked to show the graphical display (**History Viewer**). It also indicates which addresses have data loggers. This screen allows for monitoring and troubleshooting the RS485 bus and transmitters. Communication errors and transmitter status codes are listed in the **Status** column. The column named **Parameter 3** will turn red if a unit is in alarm status. This will turn yellow when the alarm is acknowledged by the user. This means there is an ongoing alarm, and it is acknowledged. When the alarm is turned off or when the corrosion rate resets to below the alarm rate, the column will return to normal. If a unit enters an alarm status and resets prior to user acknowledgement, red indicator will change color to blinking green and gray and will reflect this on the **Event Log**.



Chapter 7
Event Log

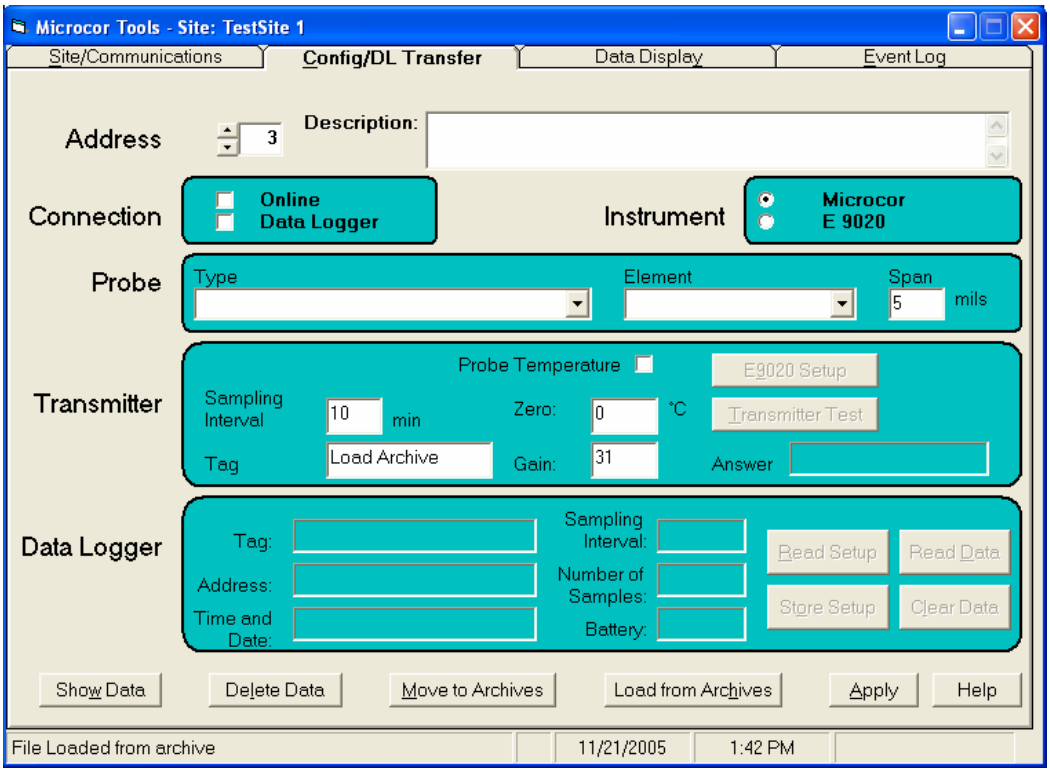
The **Event Log** tab is intended to collect and store different types of events in the system and to present them in a table format. The events are stored in a 500 element buffer. The **Save** permits export of the event log information in to a text-format file. If a unit enters an alarm status and resets prior to user acknowledgement, red indicator will change color to blinking green and gray and will reflect this on the **Event Log**; hence it is highly recommended that the **Event Log** is inspected regularly.



Date	Time	Address	Description
05,Feb,2007	14:19:47		Data Collection Started
05,Feb,2007	14:19:46	2	CommErr
05,Feb,2007	14:19:36	2	PortClosed
05,Feb,2007	14:19:15	7	Data File Loaded from Archive
05,Feb,2007	14:19:06	7	Data File Moved to Archive
05,Feb,2007	13:27:34	7	Corr/Eros Rate Alarm
05,Feb,2007	13:25:42	7	Comm OK
05,Feb,2007	13:25:42	2	Comm OK
05,Feb,2007	13:25:32	7	CommErr
05,Feb,2007	13:25:32	2	CommErr
05,Feb,2007	13:25:26		Data Collection Started
05,Feb,2007	12:36:28	7	Corr/Eros Rate Alarm
05,Feb,2007	12:36:08	7	Corr/Eros Rate OK
05,Feb,2007	12:35:58	7	Corr/Eros Rate Alarm
05,Feb,2007	12:34:56		Alarm Recognized
05,Feb,2007	12:30:44	7	Corr/Eros Rate Alarm
05,Feb,2007	12:26:05		Alarm Recognized
05,Feb,2007	12:25:58	7	Corr/Eros Rate Alarm
02,Feb,2007	15:23:26	7	Corr/Eros Rate OK
02,Feb,2007	15:17:25	7	Corr/Eros Rate Alarm
02,Feb,2007	15:09:20		Data Collection Started
02,Feb,2007	15:09:19	7	Comm OK

Chapter 8
Archiving and Importing Data

Collected data may be archived when the data files become large enough to slow down the graphing function, typically over 65,000 points. Data may also be retrieved from archives into the program, and this function may also be used to import data files such as those from the previous versions of the Microcor software or from other Microcor Tools software users.



When moving data to the archives, this data is always stored in the **Archives** folder. The path is as follows; C:\Program Files\Microcor Tools\data*Site Name*\archives.

To archive a data file, select the **Address** to be archived and press the **Move to Archives** command button. Each time a file is archived, the date is added to the file name to prevent overwriting of any earlier dated file. This protection function does not operate if the data has the same date, therefore, archiving is permitted only once per day.

Archive files have automatically assigned names. For example, the archive file of location Address 15, created on 13 May, 2003 is ch15_13May03.dat. The same address archived the following day would be ch15_14May03.dat.

Note: The naming convention used for archiving allows only one archive per day.

To retrieve an archived file, press the **Load from Archives** command button. The default opening of the browse box will be the Archive folder for retrieving existing archived files.

To import data from some other data files such as those from the previous versions of Microcor or from other Microcor Tools users, browse to the required file and select the **Open** button.

Note: If importing data from other Microcor Tools users or previous versions of Microcor Tools, import the data files (*.DAT). However, these files do not contain details of probe span and probe reading interval. This information will need to be manually entered on the **Config/DL Transfer** screen. This information can be found in the source data file (*.SET). Probe reading interval can also be found on the graph by clicking the **Enable** on the **Data Cursor** and checking the reading interval.

The **Auto Archiving** feature in the main screen is designed for computers with limited storage resources. If the Auto Archiving is selected, when a site collects 2MB of data (approximately 48,620 readings or 67 days of continuous data collection (temperature data collection enabled) at a sampling interval of 2 minutes), the data file is automatically transferred into the archives folders replacing previously stored data file. Archive files use a different naming convention in this situation. For example, the archive file of location Address 15 is ch15.dat.

Note: When **Auto Archiving** is enabled, Microcor Tools initiates automatic archiving when the file reaches its limit, previous automatically stored archives will be deleted. This process will not delete any manually archived files

Appendix 1 – Alloy Multipliers

These factors are recommended for use with the E9020 instrument. They are based upon use of CORRATER® electrodes which have surface areas of 5cm^2 for "standard" probes and 0.5 cm^2 for "flush" probes

UNS Code	Material	Multiplier
K03005	Pipe Grade Carbon Steel	1.00
A91100	Aluminum 1100-0	0.94
A92024	Aluminum 2024	0.88
C11000	Copper 110 ETP Comm. Pure	2.00
C44300	CDA 443 Arsenical Admiralty	1.67
C44500	CDA 445 Phosphorized Adm.	1.68
C64200	CDA 642 A1 Silicon Bronze	1.48
C68700	CDA 687 Alum. Brass Arsenical	1.62
C70610	CDA 706 90/10 Copper/Nickel	1.80
C71500	CDA 715 70/30 Copper/Nickel	1.50
G41300	AISI 4130 Alloy Steel	1.00
L50045	Lead	2.57
N04400	Monel 400 Nickel	1.13
N05500	Monel K-500 Nickel	1.04
N06022	Hastelloy C22	0.85
N06600	Inconel 600 Nickel	0.95
N08020	Carpenter 20 CB3 SST	0.98

UNS Code	Material	Multiplier
N08800	Incolloy 800	0.89
N08825	Incolloy 825	0.88
N10276	Hastelloy C276	0.86
R50400	ASTM B-348 Grades 2-4 Titanium	0.75
S30400	AISI 304 Stainless Steel	0.89
S31600	AISI 316 Stainless Steel	0.90
S31603	AISI 316L Stainless Steel	0.90
S31803	2205 Duplex Stainless Steel	0.89
S32750	2507 Duplex Stainless Steel	0.88
Z17001	Grades 1A, 1, 2, 3, or 5 Zinc	1.29

Appendix 2 – Modbus Configuration

RCS Microcor® Intelligent Interface Unit Modbus Configuration

Modbus Slave ID: 1
Modbus Data Type: Float 32

			Microcor Transmitters - Model MT-9485A					
			Parameter (Unit)	Metal Loss (mm)	Temp Change (deg F)	Calc Rate (mm/yr)	Calc Rate w/ 24h filter	Status
Description	Tag Number	Span of Probe	Transmitter Address (I/N)	Modbus Address	Modbus Address	Modbus Address	Modbus Address	Modbus Address
Network 1								
	TAG	10 MIL	0	40,001	40,129	40,257	40,385	40,513
			1	40,003	40,131	40,259	40,387	40,515
			2	40,005	40,133	40,261	40,389	40,517
			3	40,007	40,135	40,263	40,391	40,519
			4	40,009	40,137	40,265	40,393	40,521
			5	40,011	40,139	40,267	40,395	40,523
			6	40,013	40,141	40,269	40,397	40,525
			7	40,015	40,143	40,271	40,399	40,527
			8	40,017	40,145	40,273	40,401	40,529
			9	40,019	40,147	40,275	40,403	40,531
			10	40,021	40,149	40,277	40,405	40,533
			11	40,023	40,151	40,279	40,407	40,535
			12	40,025	40,153	40,281	40,409	40,537
			13	40,027	40,155	40,283	40,411	40,539
			14	40,029	40,157	40,285	40,413	40,541
			15	40,031	40,159	40,287	40,415	40,543
			16	40,033	40,161	40,289	40,417	40,545
			17	40,035	40,163	40,291	40,419	40,547
			18	40,037	40,165	40,293	40,421	40,549
			19	40,039	40,167	40,295	40,423	40,551
			20	40,041	40,169	40,297	40,425	40,553
			21	40,043	40,171	40,299	40,427	40,555
			22	40,045	40,173	40,301	40,429	40,557
			23	40,047	40,175	40,303	40,431	40,559
			24	40,049	40,177	40,305	40,433	40,561
			25	40,051	40,179	40,307	40,435	40,563
			26	40,053	40,181	40,309	40,437	40,565
			27	40,055	40,183	40,311	40,439	40,567
			28	40,057	40,185	40,313	40,441	40,569
			29	40,059	40,187	40,315	40,443	40,571
			30	40,061	40,189	40,317	40,445	40,573
			31	40,063	40,191	40,319	40,447	40,575

			Corrater Transmitters - Model E9020 (Not Used)					
			Parameter	Corrosion Rate / Potential	Pitting/ (Galvanic) Current	Integrated Metal Loss	Reserved	Status
Description	Tag Number	Span of Probe	Transmitter Address (I/N)	Modbus Address	Modbus Address	Modbus Address	Modbus Address	Modbus Address
Network 1								
	TAG	10 MIL	0	40,001	40,129	40,257	40,385	40,513
			1	40,003	40,131	40,259	40,387	40,515
			2	40,005	40,133	40,261	40,389	40,517
			3	40,007	40,135	40,263	40,391	40,519
			4	40,009	40,137	40,265	40,393	40,521
			5	40,011	40,139	40,267	40,395	40,523
			6	40,013	40,141	40,269	40,397	40,525
			7	40,015	40,143	40,271	40,399	40,527
			8	40,017	40,145	40,273	40,401	40,529
			9	40,019	40,147	40,275	40,403	40,531
			10	40,021	40,149	40,277	40,405	40,533
			11	40,023	40,151	40,279	40,407	40,535
			12	40,025	40,153	40,281	40,409	40,537
			13	40,027	40,155	40,283	40,411	40,539
			14	40,029	40,157	40,285	40,413	40,541
			15	40,031	40,159	40,287	40,415	40,543
			16	40,033	40,161	40,289	40,417	40,545
			17	40,035	40,163	40,291	40,419	40,547
			18	40,037	40,165	40,293	40,421	40,549
			19	40,039	40,167	40,295	40,423	40,551
			20	40,041	40,169	40,297	40,425	40,553
			21	40,043	40,171	40,299	40,427	40,555
			22	40,045	40,173	40,301	40,429	40,557
			23	40,047	40,175	40,303	40,431	40,559
			24	40,049	40,177	40,305	40,433	40,561
			25	40,051	40,179	40,307	40,435	40,563
			26	40,053	40,181	40,309	40,437	40,565
			27	40,055	40,183	40,311	40,439	40,567
			28	40,057	40,185	40,313	40,441	40,569
			29	40,059	40,187	40,315	40,443	40,571
			30	40,061	40,189	40,317	40,445	40,573
			31	40,063	40,191	40,319	40,447	40,575

Protocol				
RS-485 2 wire, 19200 Baud, 8 data bits, 1 stop bits, no parity				
Scaling				
Note: The Modbus metal loss values are in the range of -1 to +1				
Microcor Transmitter				
Metal Loss = Modbus value x Probe Span in mils, µm, or mm as applicable				
Temperature = (Modbus value x 397) +152 Deg C				
Corrosion Rate = Modbus value x Probe Span in mils for mpy, or Probe Span in µm for µm/y, or Probe Span in mm for mm/y				
Corrater E9020 Transmitter				
Corrosion Rate = Modbus value x E9020 Full Scale Range of 200 mpy for mpy, 5000 µm/y for µm/y, or 5 mm/y for mm/y				
Potential = Modbus value x Full Scale voltage range of 2 volts, or 2000 mV				
Pitting (Imbalance) = Modbus value x Full Scale range of Corrosion rate of 200 mpy, 5000 µm/y, or 5 mm/y (Pitting units have no dimensions, but must have same scale as the Corrosion Rate)				
Current (Galvanic) in µA = Modbus value x Full Scale Current Range of 500 µA				
Integrated Metal Loss = Modbus value x Full Scale Corrosion Rate range of 200 for mils, 5000 for µm, or 5 for mm				
Status Field				
Status 1 - 2 Bytes				
Bit 0	Metal Loss Status (1=OK) Bit 0=1 if Bit 8=0, and Bit 9=0, and Bit 10=0			
Bit 1	Temperature Status (1=OK)			
Bit 2	Corrosion Rate Linear Regression (1=OK)			
Bit 3	Corrosion Rate with 24 hr filter (1=OK)			
Bit 4	Not Used			
Bit 5	Not Used			
Bit 6	Not Used			
Bit 7	Not Used			
Bit 8	Transmitter to IIU communication error (1=Error)			
Bit 9	Transmitter in Startup (1=StartUp)			
Bit 10	Probe or Probe Connection Failure (1=Failure)			
Bit 11	Not Used			
Bit 12	Not Used			
Bit 13	Not Used			
Bit 14	Not Used			
Bit 15	Not Used			
Status 2 - 2 Bytes				
Reserved				

Appendix 3 – OPC Configuration

OPC refers to OLE for Process Control protocol and is based on Microsoft's OLE/COM technology which is used for data transfer between databases.

When **Microcor Tools – Output Interfaces** is used on the RCS Intelligent Interface Unit (IIU), the Microcor Tools acts as the OPC Server to provide data transfer to the DCS, PCS or SCADA system running the OPC Client. While the principle of operation is simple, configuration can be complex as OPC is integrated into Microsoft security.

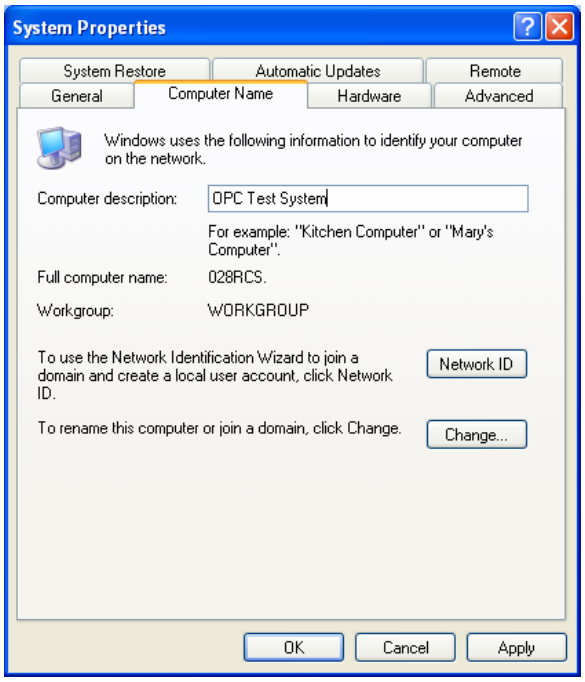
Workgroup vs. Domain Setup

Setting up the OPC Server computer or the IIU will differ on a workgroup computer network compared to a domain computer network. OPC Server computer or the IIU must be properly configured according to the local network to communicate with the client. If the local network is on a domain, the OPC Server computer or the IIU must be added to the domain, otherwise both should be in the same workgroup.

In order for the OPC Server computer or the IIU and Client to properly communicate in a domain network environment, a common username and password is required to be set on both computers. OPC Server computer or the IIU and Client must both be logged on to the domain with the same user credentials

In order for the OPC Server computer or the IIU and the Client computer to properly communicate it requires a common username and password to be set on both computers.

First, determine whether the client computer which will connect to the OPC Server computer or the IIU is set up as a part of a domain network or a workgroup network. To do this, navigate to **Start → Control Panel** (Classic View) **→ System** and double click the **Computer Name** tab of the intended client computer (shown below):



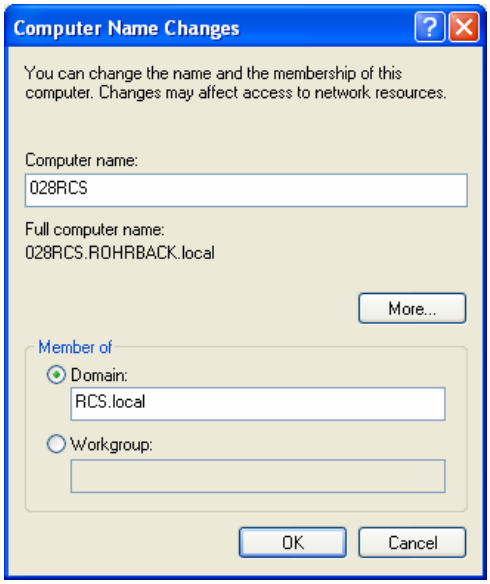
Note: The above image shows that this computer is in a Workgroup named WORKGROUP. If the system is in a domain, the word "Workgroup" will be replaced with "Domain" followed by the domain name.

Configure the OPC Server Computer or the IIU on a Domain/Workgroup

Following steps illustrates the steps taken to configure the OPC Server computer or the IIU on a workgroup or a domain network. Administrative privileges on the computer or the IIU (username, password) are required in order to switch from a domain network configuration to a workgroup. If switching from a workgroup to a domain, Administrative privileges to the domain are required (consult IT Administrator for assistance). It is recommended that IT Department assistance is enlisted when going from a workgroup to a domain network.

Navigate to **Start → Control Panel → System** and double click the **Computer Name** tab. Click on the **Change** button to advance to the **Computer Name Changes** screen shown below:

On the **Member of** area, change from Domain/Workgroup as desired. When **OK** is clicked, you will be prompted to enter the Username and Password of an administrator. If going to a workgroup, use a local computer administrator username and password, if going to a domain, have the IT Administrator enter the domain Administrator username and password.



Note: For the RCS Intelligent Interface Unit (IIU), the default administrator username and password (case sensitive) is as follows:
Username: rcsuser
Password: rcs

Set up OPC Server or the IIU for a Workgroup Network Environment

The following section will explain the additional setup steps required when configuring the OPC Server or the IIU in a workgroup network environment. An IIU as supplied is set by default as an OPC Server on a Workgroup with the name "WORKGROUP" and with automatic logon. For an IIU supplied or for systems on domains networks, skip to the next section, the **Setup the Static IP Address** below.

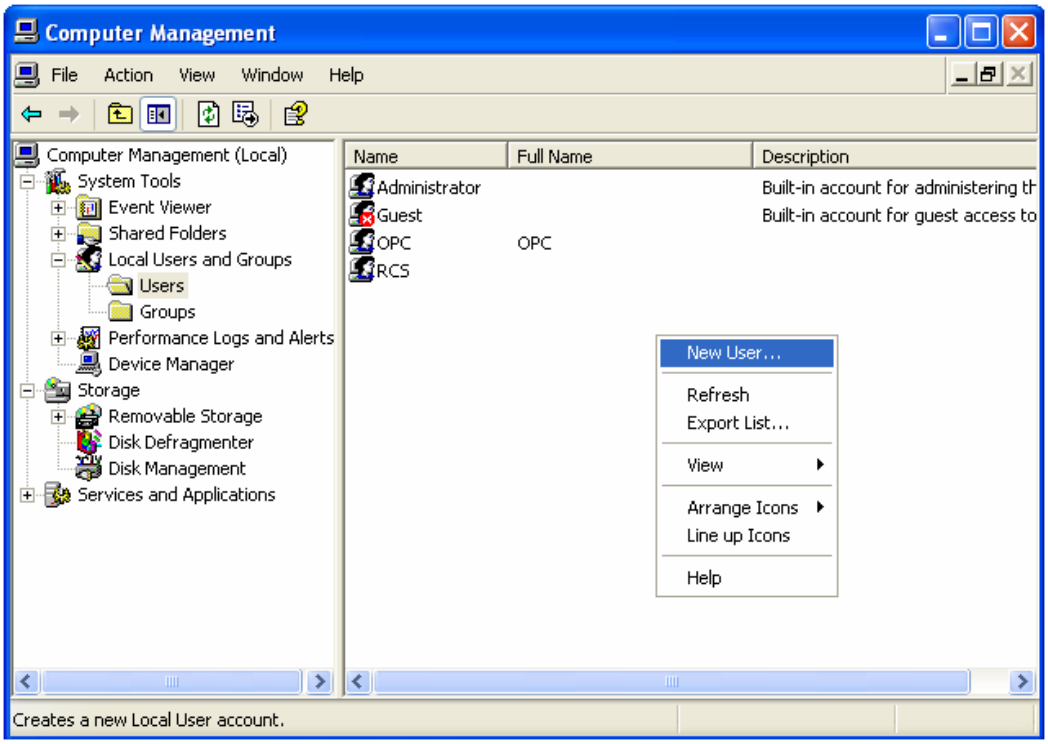
1. OPC Server or the IIU on a Workgroup Network – IIU Default

In order for the OPC Server or the IIU and Client to properly communicate it requires a common username and password to be set on both computers. It is recommended by RCS to use the following username and password with administrative privileges on both computers.

User Name: rcsuser
Password: rcs

Note: Administrative privileges are required on the computers to add a new user and make the necessary changes. It is recommended that you consult your organization's IT Department and obtain permission/assistance prior to changing configurations on the computers.

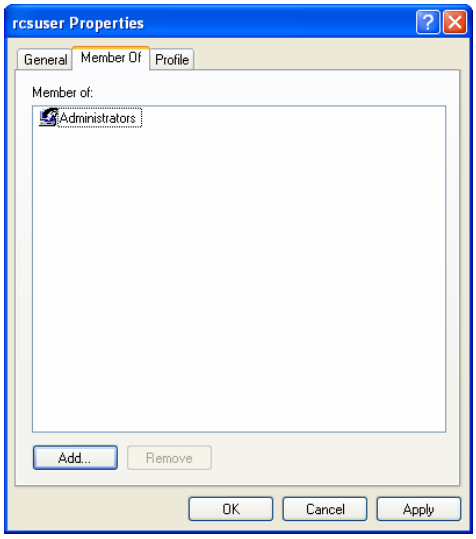
To create a new user profile, navigate to **Start → Control Panel → Administrative Tools → Computer Management** and expand **System Tools**. Find **Local Users and Groups**, expand and choose **Users**. Right click on the right hand side and select **New User**.



This will open a New User dialogue box, Enter ***rcsuser*** as the **User name** and ***rcs*** as the **Password** and confirm the password.

Before pressing the **Create** button, uncheck "User must change password at next logon." Make sure to check the password as "password never expires" and "user cannot change password."

Press **Create** to create the user and **Close** the **New User** dialogue box. You should now see the new **rcsuser** profile on the **Computer Management** screen. This user can now be added to be a member of the Administrators group. It is necessary for the rcsuser to have administrative privileges on the computer. To set the configuration, right click on the **rcsuser** name and select **properties**. Click on the **Member Of** tab. The rcsuser by default will be in the **Users** group. Click **Add** and type in **Administrators** as the object type and click **OK**. Click on **Users** and click **Remove** (once above steps are completed, rcsuser will have administrative privileges on the computer, see image below).



2. Setup Automatic Logon – IIU Default

Note: Administrative privileges are required to make changes to the registry. Follow steps with utmost caution to prevent serious damage to the operation of the Operation System.

Caution: Deleting/Editing Registry Keys can cause serious damage to the operation of the system, only manipulate the described keys below. It is recommended that you consult your organization's IT Department for assistance

Use the Registry Editor to add the log on information, follow the steps below:

1. Click **Start → Run**, type ***regedit*** and click **OK**.

2. Locate the following registry key:
   - HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\WindowsNT\CurrentVersion\Winlogon
   - Double-click the **DefaultUserName** entry, type **rcsuser**, and then click **OK**.
   - Double-click the **DefaultPassword** entry, type **rcs** under the value data box, and then click **OK**.

3. If there is no DefaultPassword value, create the value by follow the steps below:
   - In Registry Editor, click **Edit**, click **New**, and then click **String Value**.
   - Type **DefaultPassword** as the value name of the New Value created, and then press **ENTER**.
   - Double-click the newly created key, and then type your password (***rcs***) in the **Value Data** box and click **OK**.

4. If no DefaultPassword string is specified, Windows XP automatically changes the value of the AutoAdminLogon registry key from 1 (true) to 0 (false) to turn off the AutoAdminLogon feature. Double-click the **AutoAdminLogon** entry, type **1** in the **Value Data** box, and then click **OK**.

5. If there is no AutoAdminLogon entry, create the entry by performing the following steps:
   - In Registry Editor, click **Edit**, click **New**, and then click **String Value**.
   - Type **AutoAdminLogon** as the value name, and then press **ENTER**.
   - Double-click the newly created key, and then type **1** in the **Value Data** box.

6. Exit the Registry Editor.

7. Click **Start → Shutdown → Restart**, and then click **OK**. The computer will automatically log onto the rcsuser profile.

Setup the Static Internet Protocol (IP) Address

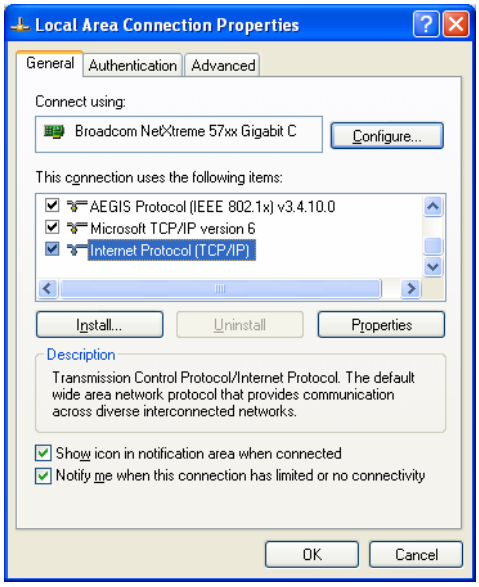
In order for the OPC Server computer or the IIU and the OPC Client computer to communicate, IP Addresses may need to be set. The following recommended procedure is for networks that support Dynamic Host Configuration Protocol (DHCP).

It is recommended that the OPC Server or the IIU is set up with **Internet Protocol (TCP/IP) Properties** to "**Obtain IP Address automatically**" and the **Alternate Configuration** to be configured with the suggested following settings (default configuration of the IIU):

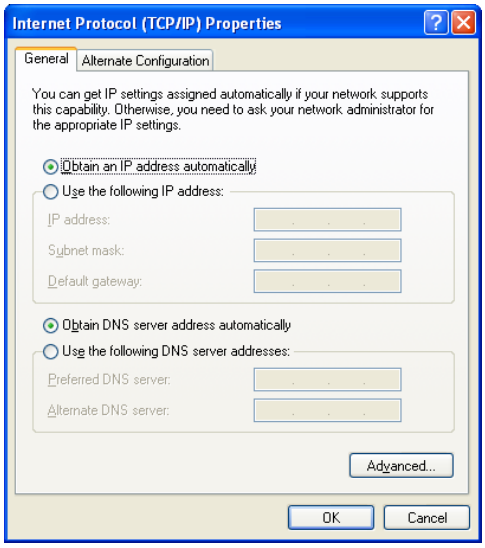
IP Address: **192.168.3.1**
Subnet Mask: **255.255.255.0**
Default Gateway: **192.168.3.254**

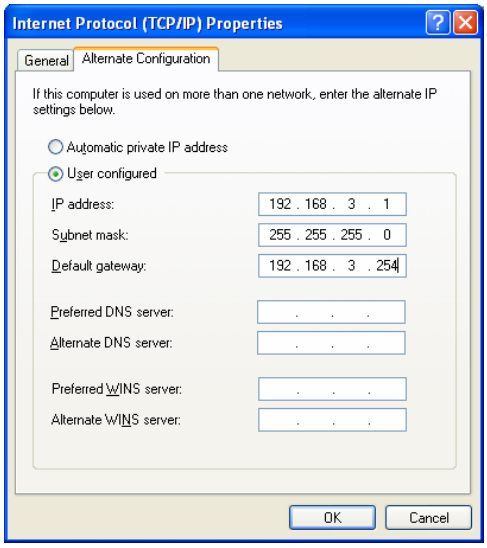
This configuration enables the OPC Server computer or the IIU to be plugged directly into a domain network and obtain an IP Address from the DHCP Server or use the Alternate Configuration if a DHCP Server is not found or unavailable (if a cross-over cable is used). In order for the OPC Client computer to connect when a DHCP Server is unavailable, the Alternate Configuration on the client computer should be setup with an incremented IP Address such as **192.168.3.2** (IP Address range must be within 192.168.3.**2** to 192.168.3.**253**). Consult your IT Department for more details.

The typical navigational path to make the TCP/IP changes is **Start → Control Panel → Network Connections → Local Area Connection.** Right-click and select **Properties**. Scroll, find and select the **Internet Protocol (TCP/IP)** under the **General** tab and click the **Properties** command button. See image below:



Set the configuration as follows under the **General** and **Alternate Configuration** tabs:

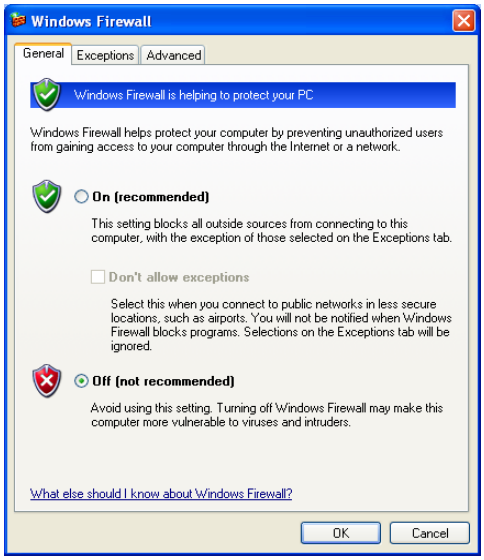

Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address:
Subnet mask:
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Advanced...
OK
Cancel


Internet Protocol (TCP/IP) Properties
General
Alternate Configuration
If this computer is used on more than one network, enter the alternate IP settings below.
Automatic private IP address
User configured
IP address: 192 . 168 . 3 . 1
Subnet mask: 255 . 255 . 255 . 0
Default gateway: 192 . 168 . 3 . 254
Preferred DNS server:
Alternate DNS server:
Preferred WINS server:
Alternate WINS server:
OK
Cancel

Note: If Static IP Addresses are used exclusively in the Domain or Workgroup, consult your IT Department for available Static IP Addresses, Subnet Mask, Default Gateway and assistance.

Windows Firewall Setup

Navigate to **Start → Control Panel → Windows Firewall** and select **Off (not recommended)** and click **OK**.

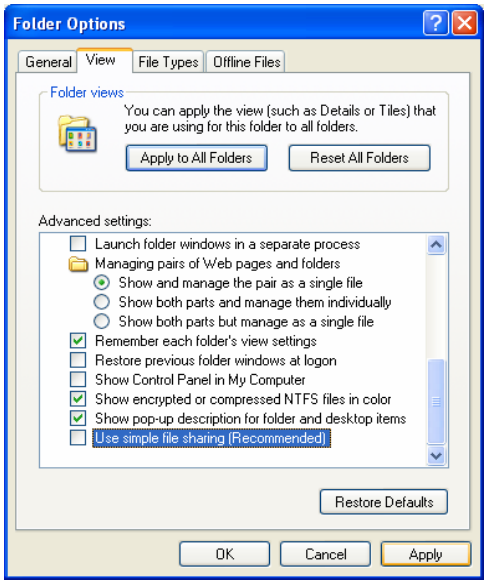

Windows Firewall
General
Exceptions
Advanced
Windows Firewall is helping to protect your PC
Windows Firewall helps protect your computer by preventing unauthorized users from gaining access to your computer through the Internet or a network.
On (recommended)
This setting blocks all outside sources from connecting to this computer, with the exception of those selected on the Exceptions tab.
Don't allow exceptions
Select this when you connect to public networks in less secure locations, such as airports. You will not be notified when Windows Firewall blocks programs. Selections on the Exceptions tab will be ignored.
Off (not recommended)
Avoid using this setting. Turning off Windows Firewall may make this computer more vulnerable to viruses and intruders.
What else should I know about Windows Firewall?
OK
Cancel

Note: Once the setup procedure is completed and communication is verified, enable the firewall following the same process as above and selecting **ON (recommended).**

Note: If a cross-over cable is used to connect to the IIU or the OPC Server computer, then the Windows Firewall may be required to be turned off prior to establishing the connection. Re-enable the firewall after disconnecting from the IIU or the OPC Server computer.

Setup Windows Folder Properties: Disable "Use Simple Sharing" – IIU Default

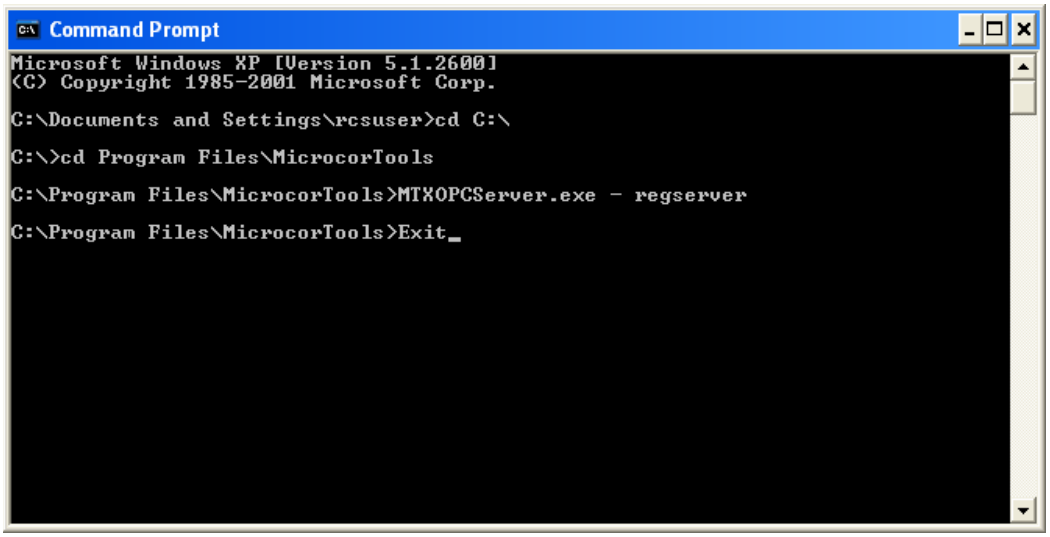
Double click **My Computer** from the desktop or right click **Start** and select **Explorer**. Click **Tools → Folder Options** and select **View** tab (shown below). Uncheck the "Use simple file sharing (Recommended)" and click **Apply** followed by **OK**.


Folder Options
General
View
File Types
Offline Files
Folder views
You can apply the view (such as Details or Tiles) that you are using for this folder to all folders.
Apply to All Folders
Reset All Folders
Advanced settings:
Launch folder windows in a separate process
Managing pairs of Web pages and folders
Show and manage the pair as a single file
Show both parts and manage them individually
Show both parts but manage as a single file
Remember each folder's view settings
Restore previous folder windows at logon
Show Control Panel in My Computer
Show encrypted or compressed NTFS files in color
Show pop-up description for folder and desktop items
Use simple file sharing (Recommended)
Restore Defaults
OK
Cancel
Apply

Install Microcor Tools Software and OPC Server Application – IIU Default

Install the Microcor Tools 4.0 Software from the installation CD. It is important to retain all default options when installing. Once the installation is complete, follow the steps below to register the OPC Server.

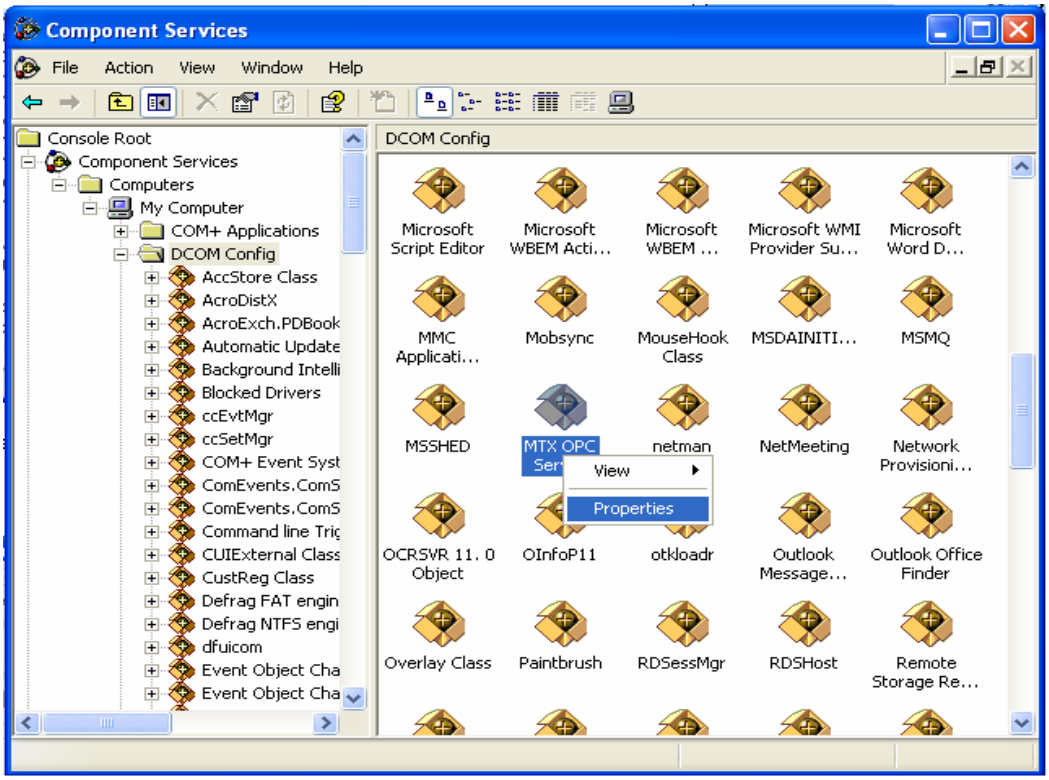
1. Click **Start → Run**, type ***cmd*** and click **OK**.
2. Type **cd C:**
3. Type **cd Program Files\MicrocorTools**
4. Type **MTXOPCServer.exe – regserver**
5. Exit Command Prompt window (see image below). If errors are encountered, make sure all steps are performed as explained above and that the user has sufficient privileges on the computer.
6. Install OPC Client Test Utility (Consult RCS for more information).



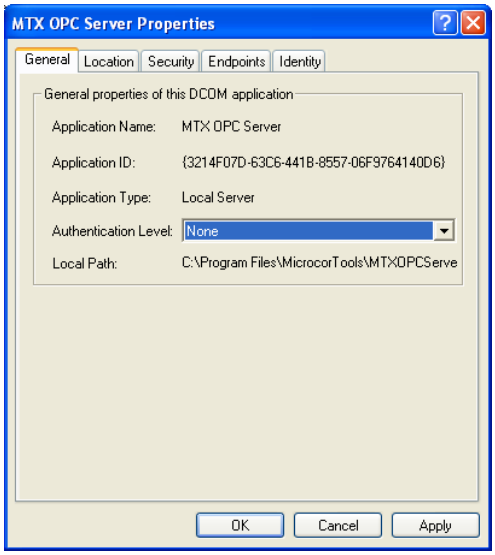
Setting up DCOM Properties for Workgroup Networks Only – IIU Default

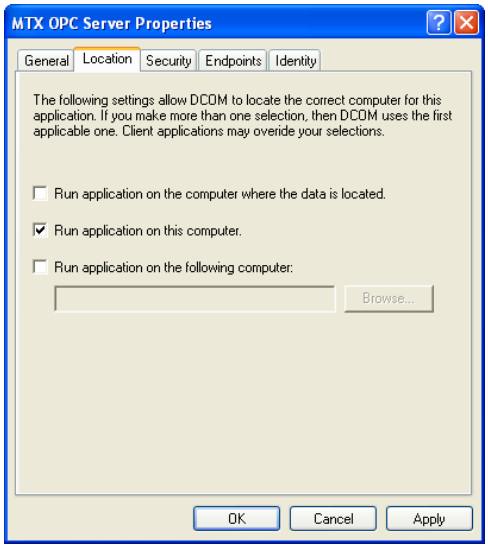
DCOM properties must be configured to assure the communication between the OPC Server and Client when using workgroup networks. Skip to the next section **Launching OPC Server** if using a domain network.

To setup the DCOM properties, navigate to **Start → Control Panel → Administrative Tools → Component Services**. Expand the **Console Root** by clicking on it, click on the **Component Services → Computers → My Computer → DCOM Config** (see image below).

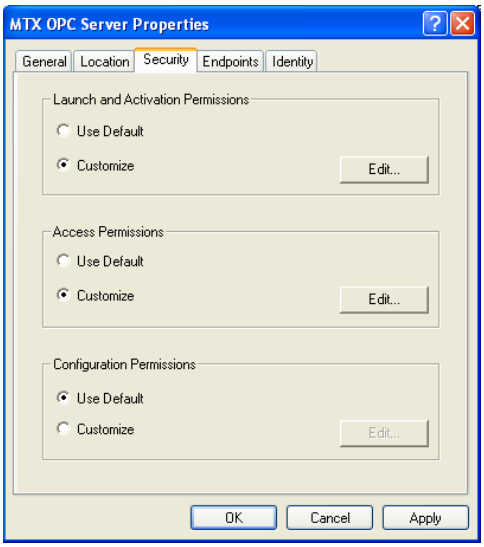


Find the **MTX OPC Server** entry and right click and choose properties (shown above). Change the **Authentication Level** to **None** on the **General** tab and select only the "Run application on this computer" on the **Location** tab and click **Apply** as shown below.

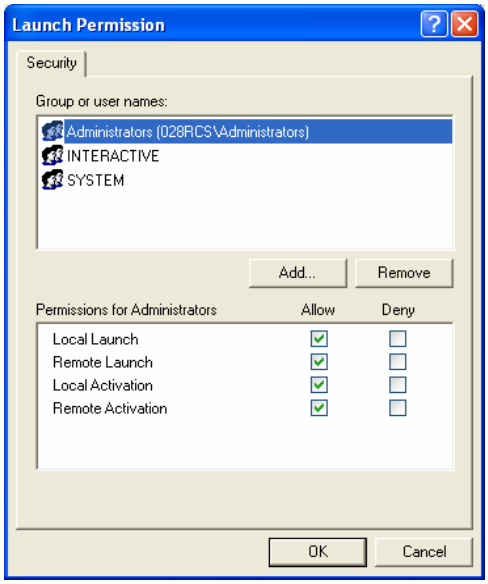



MTX OPC Server Properties
General
Location
Security
Endpoints
Identity
The following settings allow DCOM to locate the correct computer for this application. If you make more than one selection, then DCOM uses the first applicable one. Client applications may overide your selections.
Run application on the computer where the data is located.
Run application on this computer.
Run application on the following computer:
Browse...
OK
Cancel
Apply

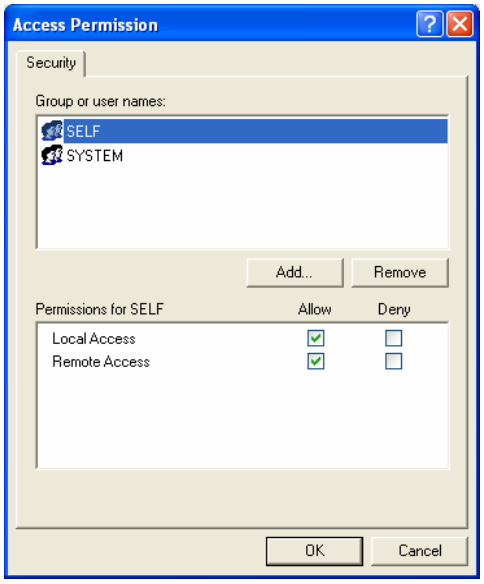
Change the **Launch and Activation Permissions** and **Access Permissions** to **Customize** and **Configuration Permissions** to **Use Default** in the **Security** tab and click **Apply**.



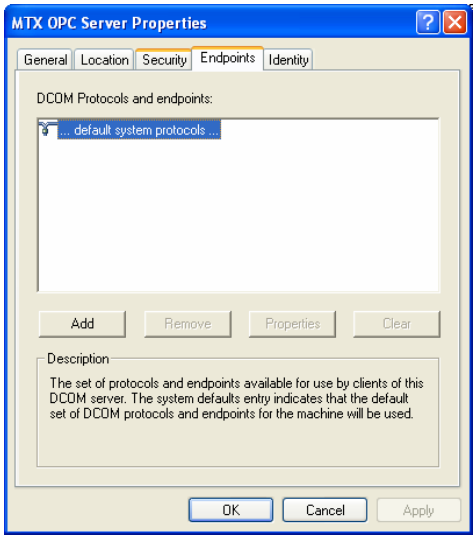
Click the **Edit** button under the **Launch and Activation Permissions** and ensure that all **Groups or Users** have full permissions allowed as shown below. Click **OK**.



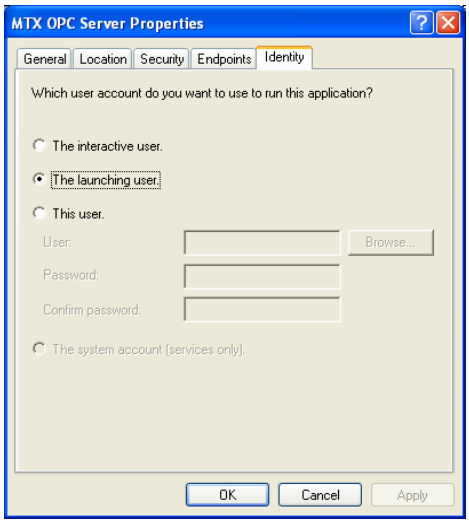
Click the **Edit** button under the **Access Permissions** and ensure that all **Groups and Users** have full permissions allowed as shown below. Click **OK**.



Click **Apply** on the **Security** tab before moving on to the **Endpoints** tab (no changes made on the **Endpoints** tab, shown below).



Select the "The Launching User" on the **Identity** tab and click **Apply**.



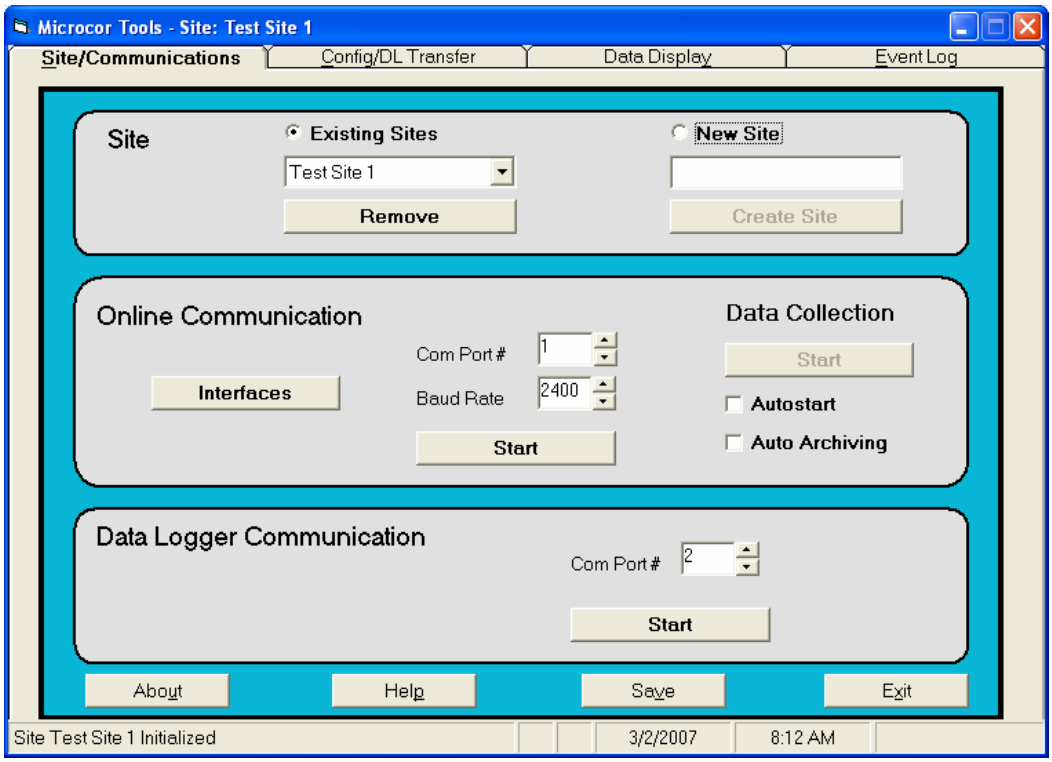
The OPC Server is now ready to be launched for the Workstation Network setup.

Launching OPC Server or the IIU

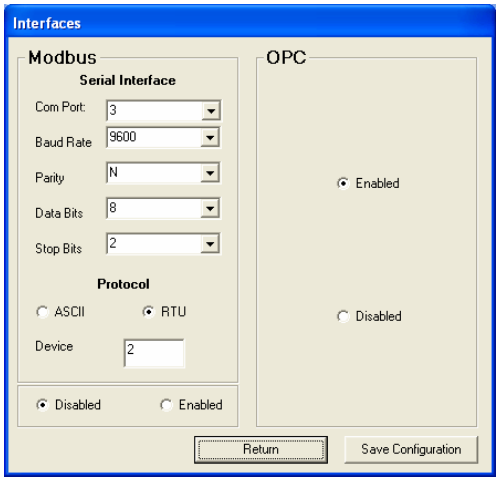
On the OPC Server computer or the IIU log on to the domain network using the credentials provided by the IT Department or a local user; if the computer is setup for a workgroup network, the computer will automatically logon (if setup guidelines were followed). Launch the OPC Server on the **Microcor Tools – Interface Option** release by performing the following steps:

1. Run the Microcor Tools Software application from **Start → All Programs → RCS → Microcor Tools**.

2. Create a **New Site** or choose an **Existing Site** to enable the Online Communication Area.

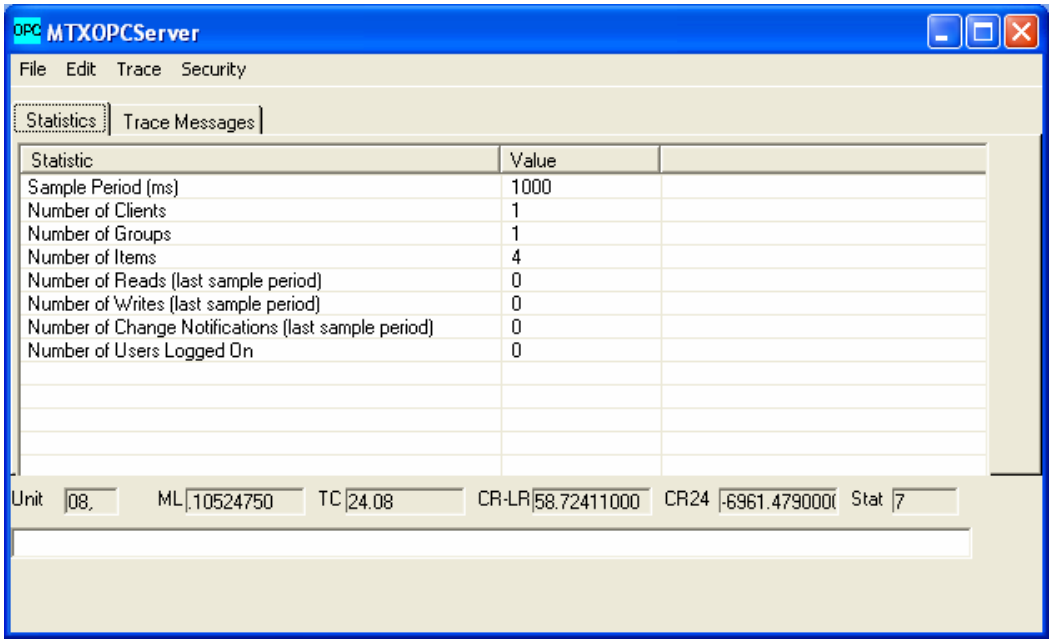


3. Click on the **Interfaces** button to open the **Interfaces** screen. On the **OPC** area, select **Enabled** and **Save Configuration** and **Return**.



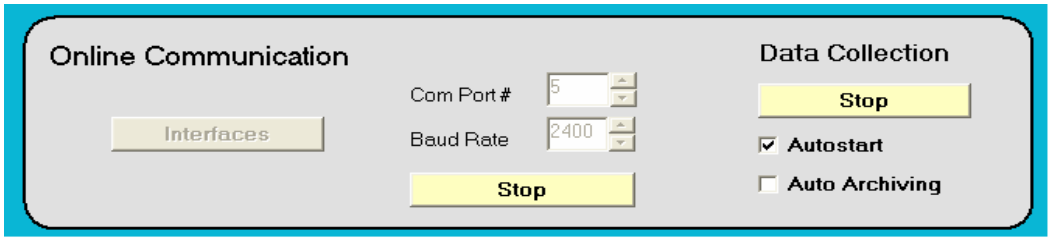
4. When the **Enabled** selection is made, **OPC** icon will appear on the Windows Status bar as shown below:

5. Double-click on the **OPC** icon show above to open the OPC Server status screen. Users may monitor the connections from this screen. The values for statistics will dynamically change as clients log on and off of the OPC Server status screen.



Note: It is important to note that the OPC Server shows values (Unit, ML, TC, CR-LR, CR24 and Stat) on the status bar. There values will only be present if the data are transferring correctly; otherwise the values will be blank. This means that either the **Online Communication** - **Interfaces** area is not properly configured or that the OPC Server was invoked by the OPC Client Test Utility installed on the computer (OPC Client Test Utility is preinstalled only on computers provided by RCS), see the **Troubleshooting** section below for more details.

6. The OPC Server is now set to transfer data. Make sure to **Start** the **Online Communication** and **Data Collection** (shown below); your OPC Client computer will now receive the data being transferred (make sure to use the same credentials on the OPC Client computer as used on the OPC Server computer).

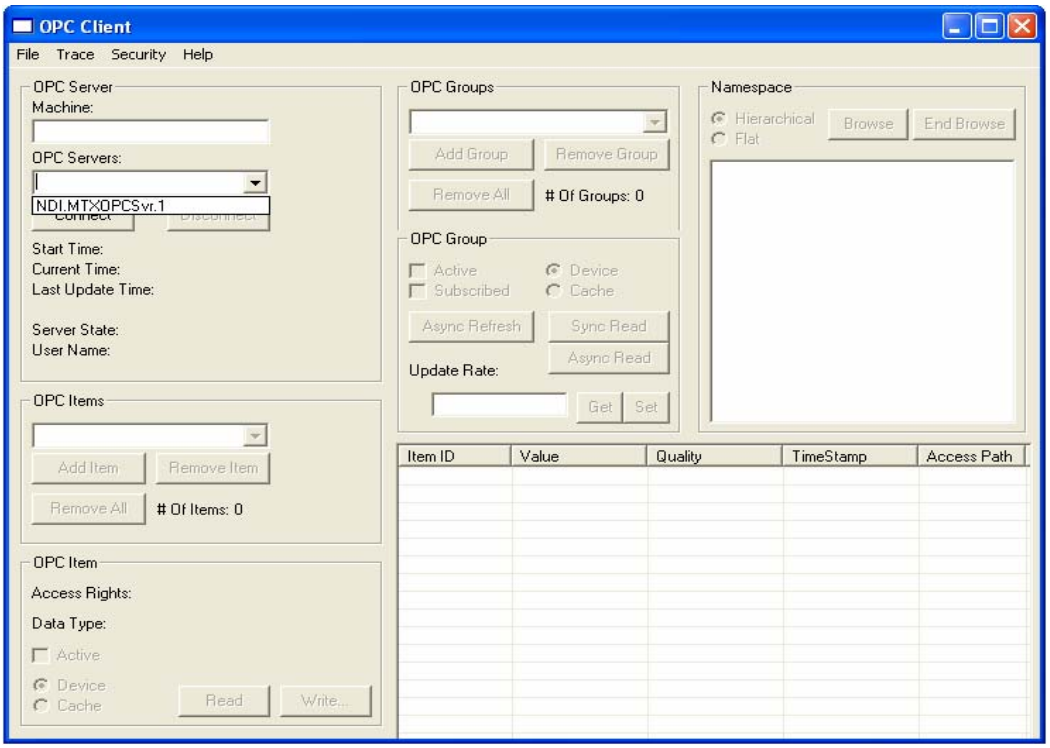


Using the Preinstalled OPC Client Test Utility on RCS IIU to Test the OPC Server

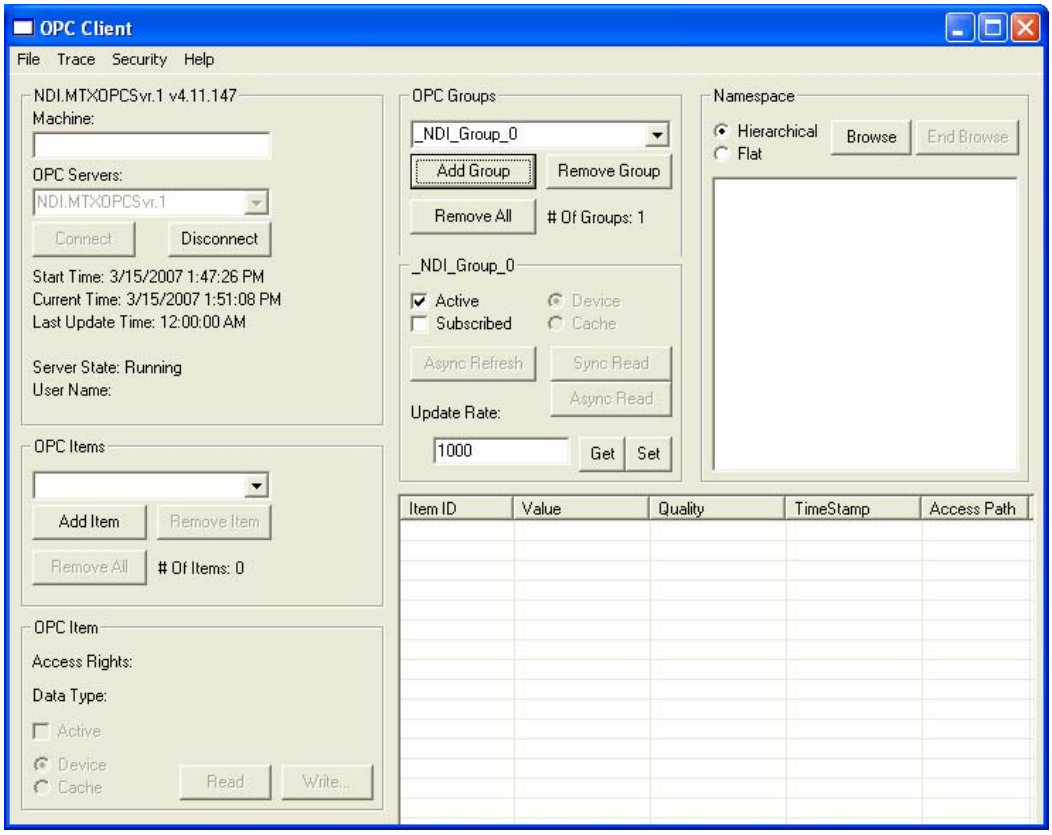
If the OPC Server computer or the IIU is configured and shipped by RCS, an OPC Client Test Utility application will also be installed just to verify the functionality of the OPC Server. This OPC Client Test Utility can be run by following the steps below:

1. Run the OPC Client Test Utility application from **Start → All Programs → VB6Client**

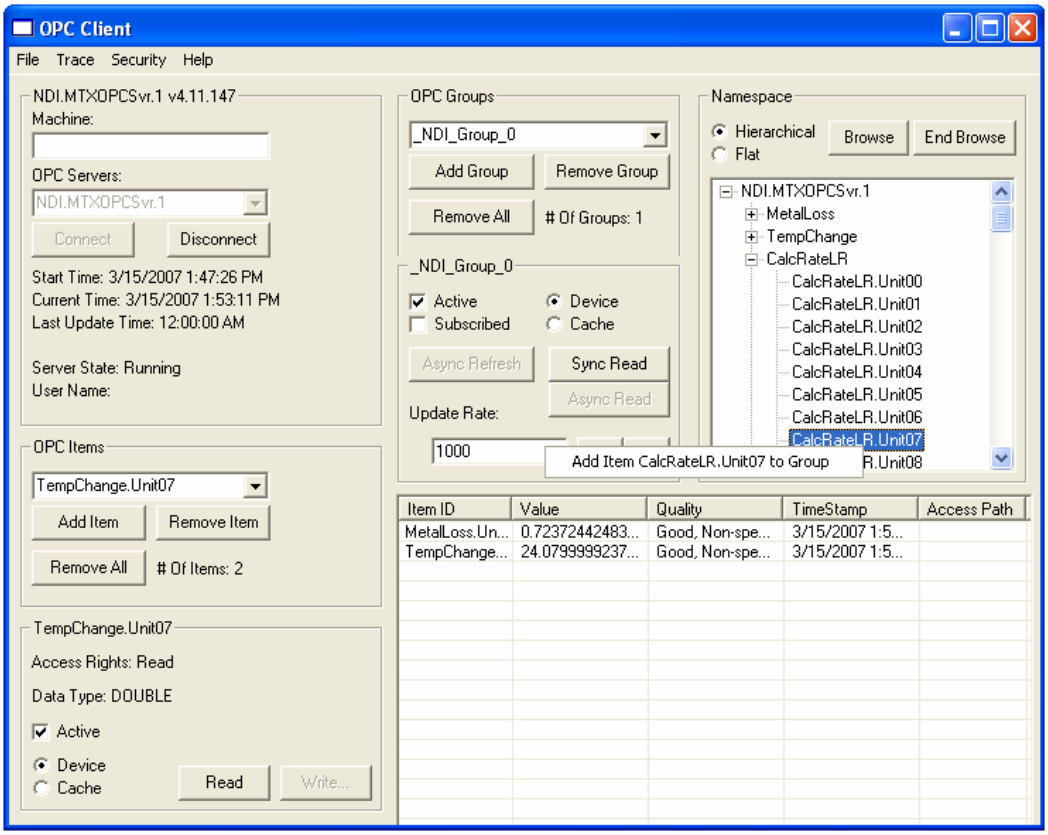
2. Normally, in order for a client to see a server, the OPC Server PC name or the IP address must be typed in; however in this case since both the server and the client reside on the same machine, click on the drop-down arrow of the **OPC Servers:** to automatically browse to find the OPC Server. When the client is found, click on it to make the selection and then click on the **Connect** button.



3. Click on the **Add Group** button of the **OPC Groups** area. This will browse, find and enter the group to the text box.



4. Click on the **Browse** button of the **Namespace** area. This will browse, find and enter the **Namespace** group on the text area. Expand the selection by clicking on the plus (⊞) sign to show the detailed listing. Click the plus (⊞) sign as required to see the individual selections. **Right-click** on each selection and **left-click** to select and view the data online.



Troubleshooting

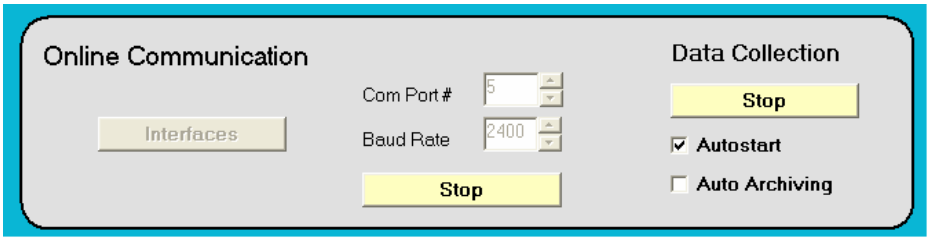
1. OPC Server is started and the OPC Client Test Utility on the same computer can connect, but the Remote OPC Client computer cannot connect.

    - Disable the Windows Firewall temporarily on both computers until the connection is established.

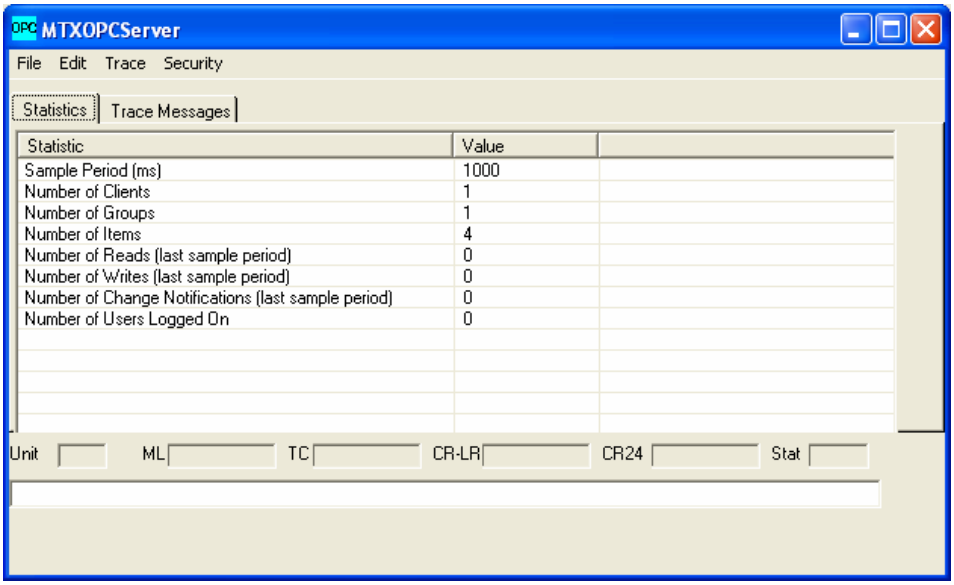
    - Ensure the IP Addresses are correct and the connection cables are secure on the OPC Server computer or the IIU and the OPC Client computer.

2. OPC Server is started and the Client is connected but Client shows 0 for transferred values.

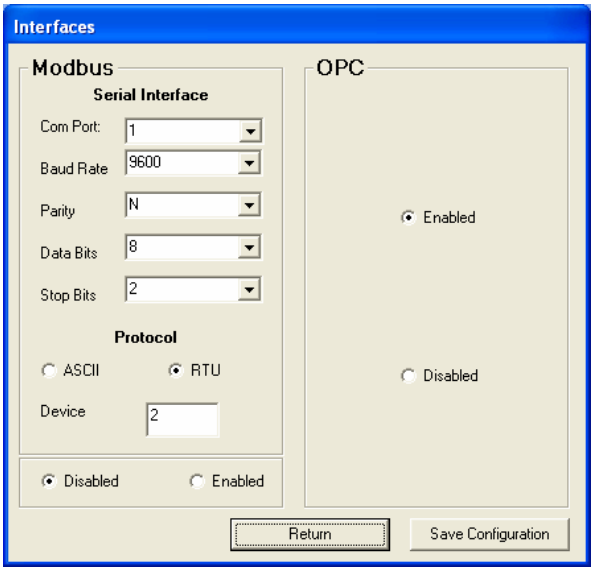
    - Ensure that the **Start** buttons are activated on the **Online Communication** and **Data Collection** as shown below on the on the **Site/Communications** screen.



- Check the OPC Server status by clicking on the OPC icon on the status bar. If the OPC Server does not show values (Unit, ML, TC, CR-LR, CR24 and Stat) on the status bar then check the **Online Communication** - **Interfaces** area to ensure the OPC interface has been **Enabled** (see the following images).

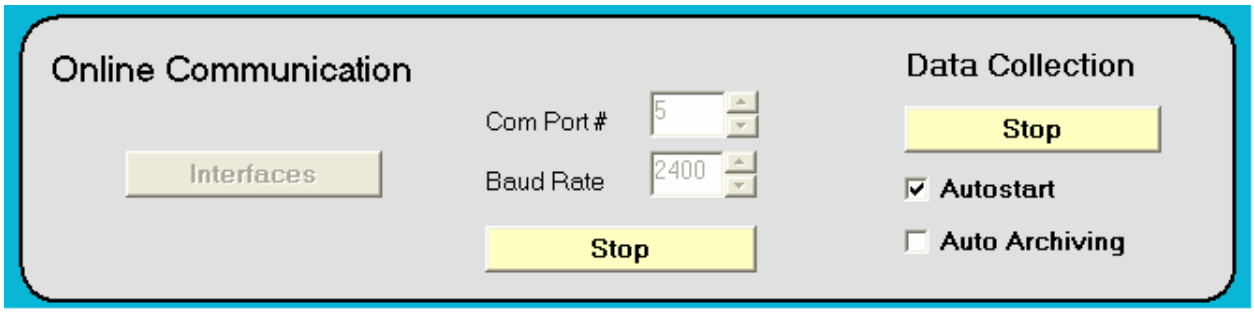


If the Status bar shows no activity as shown above then the OPC Server is not transferring data. **Enable** the OPC Interface and **Save Configuration** as shown below:



3. OPC Client computer does not receive data after the OPC Server computer reboot.

   - Ensure the Autostart is checked on the **Online Communication** area, shown below:



   If the Autostart was selected, click Stop to enable the Interfaces button. Click the Interfaces button and make sure the **Enabled** is selected on the OPC area; **Save Configuration** and **Return** and try again.